Advisory Circular

AC No. 00-59

November 13, 1998

Integrating Helicopter and Tiltrotor Assets Into Disaster Relief Planning

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Initiated by AND-710

1. PURPOSE. This Advisory Circular (AC) provides general guidance on integrating helicopters and tiltrotor aircraft into disaster relief planning efforts. This document is advisory in nature and is intended to provide a planning tool to assist State and local emergency planners. It is fully recognized that every State and municipality has distinctive and unique requirements that may warrant modifications to the advice presented herein.

2. BACKGROUND. During the last four decades, helicopters have proven their value to communities when disasters strike. And yet, all too often, people simply assume that these aircraft will arrive when needed. However, without careful planning, helicopters and tiltrotors may not appear, or if they do, they may not be used to their best advantage. This AC identifies issues that need to be addressed, provides general guidance on how they may be addressed, and lists various contacts and references that may be helpful during the planning and execution of disaster relief plans.

3. TERMINOLOGY. As used in this document, the term "vertical flight aircraft" applies to both helicopters and tiltrotor aircraft. The "tiltrotor" aircraft is one type of aircraft that are called "powered-lift vehicles". Tiltrotor aircraft can takeoff, land, and hover similar to a helicopter and can fly similar to a turboprop airplane.

4. OPERATIONAL QUESTIONS. This AC encourages States and municipalities to plan for the use of helicopters and tiltrotors in support of disaster relief operations. As this planning progresses, the effort is likely to generate numerous questions dealing with aircraft operational issues. The Flight Standards Service is the primary FAA office responsible for promoting aviation safety and ensuring compliance with the operations and maintenance safety standards for aircraft operations. Flight Standards District Offices (FSDO's) throughout the country work closely with aviation authorities and with other federal, state, and local officials in the establishment of a variety of aircraft operations, including vertical flight aircraft involved in Emergency Medical Services, Search and Rescue, and Disaster Relief. Questions on aircraft operational matters should be referred to the FSDO's. FSDO addresses and phone numbers are given in Section 1 of Appendix A of this AC.

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CHAPTER 1. INTRODUCTION

1. BACKGROUND. On January 13, 1982, Air Florida Flight 90 crashed on takeoff from Washington National Airport. It struck the 14th Street Bridge, congested with rush hour traffic, and came down in the ice-covered Potomac River. This Boeing 737-222 had 74 passengers and 5 crew members on board. Only four passengers and one flight attendant survived. The following statements are from report DOT/FAA/RD-90/10, Rotorcraft Use in Disaster Relief and Mass Casualty Incidents - Case Studies:

> At 11:00 A.M. on Friday, January 13, 1982, the National Weather Service (NWS) issued a special weather statement that continued an earlier winter storm warning and predicted that snow would continue into the afternoon and, at times, become mixed with sleet and freezing rain.
>
> At 2:00 P.M., because of the deteriorating weather conditions, Federal agencies announced early dismissal of their employees, releasing some 400,000 commuters into the streets. Area schools also began dismissal early.
>
> At 3:00 P.M., . . . a partial gridlock had developed downtown . . . .
>
> At 3:59 P.M., Air Florida Flight 90 lifted off in a northwesterly direction. It immediately lost altitude, struck six vehicles on the 14th Street Bridge, continued through the railing and crashed into the river, which was covered with five to eight inches of ice. Weather conditions were poor and deteriorating, temperature was in the low 20's (Fahrenheit), and visibility was less than one-half mile.
>
> At 4:11 P.M., the U.S. Park Police were notified of the accident and asked to send a helicopter to assist in rescuing the survivors, some of whom were reported to be in the water.

U.S. Park Police plowed the ramp with a personal 4-wheel drive vehicle and helped the flight crew push the helicopter out of the hanger. The policemen, on duty at U.S. Park Police Headquarters in Anacostia Park, quickly grabbed life preservers and rope, boarded their Bell Long Ranger, and flew "Eagle One" toward the 14th Street Bridge.

> While en route, the crew of Eagle One was given three separate locations for the accident site. However, they headed for the bridge.
>
> When Eagle One reached the immediate area, repeated attempts to reach the ground units by radio for instructions were unsuccessful. Personnel on the ground had not switched to the correct frequency until 4:22

PM - two minutes too late to hear Eagle One. Early attempts with ropes and ladders to reach the survivors 50 to 100 feet offshore failed. Boats and divers were not yet on the scene.

"When you see an airline disaster you expect mayhem and slaughter," said the pilot during a later mterview. "Their biggest surprise was that there was only broken ice where apparently, the main fuselage had gone through, the tail section above the water with six people hanging on it, and a lot of debris, insulation, luggage, and clothes." There would only be those six to rescue. The others were doomed the moment the water rushed into their ruptured (airliner) cabin.

The six had to be rescued quickly before the frigid water claimed them. One woman lost her grip and was about to drown when an onlooker plunged into the river and brought her close enough to the bank for a fireman to swim out and retrieve her. Later, doctors would measure the woman's body temperature at 81 degrees Fahrenheit; she was only a few minutes from death by cardiac arrest.

The rescue ended on a wrenching note: one of the six people clinging to the tail had repeatedly passed the lifeline to fellow passengers rather than save himself. When the helicopter went back for him, he had slipped beneath the surface.

That even five people survived was due, in part, to the timely arrival of a helicopter. Despite a lack of proper on-board rescue equipment, they were able to ferry the survivors to shore. Their efforts provided dramatic proof of the helicopter's effectiveness as a disaster relief tool. Ironically, the helicopter was not there as part of any planned disaster response, but rather by a fortunate combination of circumstances.

2. THE NEED FOR PLANNING. Often, it seems as if helicopters just "appear" at disaster situations. The public is generally unaware of the extensive planning necessary for helicopters and tiltrotors to lend their unique assistance in the most effective manner. Historically, many public agencies charged with disaster response preparation have shared this lack of awareness. Still, as illustrated in many disasters during the last four decades, helicopters have proven their value in disaster relief operations.

3. USE OF HELICOPTERS AND TILTROTORS IN DISASTER RELIEF. This AC is intended to aid emergency preparedness agencies with the planning and use of vertical flight aircraft in disaster relief. These guidelines are based on accepted planning concepts and "lessons learned" through the study of disaster case histories where helicopters were used. Rotorcraft Use in Disaster Relief and Mass Casualty Incidents - Case Histories, report number DOT/FAA/RD-90/10, details 18 such incidents.

a. Disaster Planning. Disaster planning is the responsibility of many public and governmental agencies at various levels. The vast majority of those agencies are proficient and effective in that effort, yet historically some have not been fully aware of the helicopter assets that might be available. In an increasing number of cases, however, communities have identified their vertical flight resources. For example, the Dallas/Fort Worth Metroplex has successfully incorporated locally based helicopters into disaster preparedness planning. They regularly hold realistic exercises to test planning effectiveness and to resolve problems under controlled conditions.

b. Planning: for the Full Range of Possibilities. Disaster planning should address the full range of possible events from localized incidents to major catastrophic disasters requiring implementation of the Federal Response Plan (FRP). Ideally, the helicopter and tiltrotor portions of this planning will blend seamlessly with local and State disaster relief plans for events up to and including activation of the FRP.

c. State and Regional Disaster Airlift (SARDA) Planning. Disaster planning for the use of aircraft and resources, including helicopters and tiltrotors, is guided by FAA Advisory Circular (AC) 00-7, State and Regional Disaster Airlift (SARDA) Planning. The FAA issued this advisory circular to encourage the use of aviation in supporting disaster relief activities. Consult your state aviation or division of aeronautics office for further information and for how your local planning should tie into state level planning.

d. The Use of Emeraencv Medical Service (EMS) Helicopters. The concept, of using medical evacuation (medevac) or emergency medical service (EMS) helicopters to reduce mortality rates, has been well established since the Vietnam conflict. Thousands of traumatic injury victims who reached medical treatment facilities within the first "golden hour" owe their lives to the helicopters and crews that delivered them rapidly to specialized medical facilities. In the USA, more than 250 hospitals have established EMS helicopter ambulance services and many others have a helipad located near their emergency room entrances. EMS helicopter operations have experienced spectacular growth since 1972. This continues to be one of the most dynamic sectors of the aviation industry today.

e. The Use of Other Helicopters. As widespread as EMS helicopters have become, they are still limited in their ability to respond to large disasters. Fortunately, while there are a limited number of EMS helicopters in a given community, there are often a great number of private, government (state and local), and military helicopters available. Air medical service helicopters are configured for flying critically injured patients from hospital to hospital or from an accident scene to a trauma facility. Often in disaster situations, help is needed to perform a variety of support functions that are not best performed by an EMS helicopter. Non-commercial helicopter operators are often ready, willing, and able to provide assistance when needed.

4. ADVISORY CIRCULAR GOALS. Participants in emergency planning and response must understand the plan and their role in it. People are highly motivated to participate in direct lifesaving missions, but there are many other vital missions that may require the use of helicopters and tiltrotors in an emergency response. The goals of this AC are described below.

a. To Save Lives. Trauma specialists are well aware of the first "golden hour" after a trauma injury and its significance in the reduction of mortality rates. EMS helicopters routinely transport severely injured patients over long distances, inaccessible areas, heavy traffic, or disrupted ground transportation to appropriate treatment facilities. Equally important is their ability to transport medical personnel and equipment directly to the scene. In disasters, the number of injury cases requiring rapid transport and the number of support functions required highlight the benefits of vertical flight aircraft. Emergency response to remote sites may prove to be an agonizingly and dangerously slow process. Examples include missions through flooding, snow drifts, or rush-hour traffic. The term "remote sites" can include high-rise rooftops in the middle of major metropolitan areas. In disaster situations, helicopters and tiltrotors can help save lives.

b. To Acquaint Community Leaders and Planners with Helicopter and Tiltrotor. Disaster Relief Canabilities. Most people have little knowledge about helicopter and tiltrotor availability, operations, and capabilities. The same can be said of familiarity with the use of the general aviation fleet, including fixed-wing aircraft, as well as active and reserve military assets. It is essential to have a complete understanding of aircraft capabilities and availability in order to effectively incorporate them into existing plans. In this way, planners can broaden their range of options for response to emergency situations and provide superior services to the community.

c. To Provide Planners with Guidelines to Effectively Integrate the Use of Helicopters and Tiltrotors into Local Disaster Preparedness Planning. Many emergency planners do not possess a high level of expertise in vertical flight operations nor can it be assumed that they have ready access to information on the subject. For this reason in particular, the FAA has developed these guidelines. These guidelines are provided to encourage planners to consider helicopters and tiltrotors in their overall planning efforts and to ensure safe and effective use of these aircraft.

d. To Open or Improve Lines of Communication Between Aircraft. Operators and the Community. Most helicopter operators are willing to help when needed, but they are often frustrated by a lack of communication with local disaster planning agencies. This document is intended to facilitate such communications. In this manner, it will allow communities to benefit from increased cooperation between helicopter and tiltrotor operators (civil, government, and military), and disaster planning agencies.

e. To Encourage the Establishment of Heliports and Vertiports in the Community. Helicopters and tiltrotors can land at many places where an airplane can not because they do not need a runway for a landing site. However, if they are to help in disaster situations, they do need safe landing sites in close proximity to the disaster location. This is particularly true in urban environments. If landing facilities are to be available when disasters occur, the community must plan and develop heliports and vertiports in advance of the actual event.

'5. ASSUMPTIONS. Before these guidelines can be applied in a given disaster preparedness planning effort, certain assumptions must be made regarding the nature of the situation in which helicopters and tiltrotors can be used. Also, to avoid confusion or misunderstanding of these guidelines, baseline conditions and ground rules are established to provide an appropriate foundation.

a. General Plan. Look for a general plan for local disaster relief in effect or under development. Federal and State regulations provide detailed emergency planning guidance under the umbrella of the current Federal Response Plan (FRP) and it's supporting regional and local emergency plans are now required by law. The Local Emergency Planning Committee (LEPC), Regional Planning Committee (RPC), and regional Federal Emergency Management Agency (FEMA) offices can provide a variety of invaluable information including copies of existing plans, contact data, reference material, etc. See also Appendix A for possible sources of information in your area.

b. References to planning documents can be found in the American Society for Testing and Materials, Standard Guide for Planning and Response to a Multiple Casualty Incident. Another useful document is the Federal Emergency Management Agency's, Guide for All-Hazard Emergency Operations Planning.

c. Incident Command Svstem (ICS). Incident Command System (ICS), or similar organizational structure, is probably in place. This system usually includes the process for integrating aviation assets into the State disaster response plan. The provisions in this advisory circular are intended to incorporate helicopters and tiltrotors into existing plans or into new plans as they are being developed. THE GUIDELINES OF THIS AC ARE NOT INTENDED TO SERVE AS A "STAND ALONE" DISASTER REPAREDNESS DOCUMENT.

d. Vertical Flight Aircraft Available. Obviously, an assumption must be made that helicopters or tiltrotors are available within the planning jurisdiction for disaster relief operations. A comprehensive, vertical flight integration plan would not be of value if there were no vertical flight aircraft available in a disaster situation or if the operators in the area were unwilling or unable to participate, Fortunately, this has proved to be highly unlikely in most areas. Most helicopter pilots and operators are quite willing to become involved and lend assistance. However, preplanning and endorsement

by corporate and government leadership are critical requirements.

e. Ground-Based Ambulances. Another assumption is that ground-based ambulances will be the primary means of transport in a disaster situation if roads are passable. In some instances, however, helicopters and tiltrotors will be indispensable in providing the most efficient transport service. These vertical flight aircraft may also aid the Incident Commander with other support missions that cannot be prudently accomplished with the exclusive use of ground units. However, it will never be possible to guarantee that vertical flight aircraft will be available. Quite often, the disaster situation and its attendant casualties are a direct or indirect result of extreme environmental conditions. Those same extreme conditions could preclude or severely constrain the use of aircraft in the initial phases of the response. Certainly, helicopter and tiltrotor pilots will make every effort, within the limits of safety, to be there when needed. However, they should be considered auxiliary only and reliance should always be placed first on ground-based units.

f. EMS Helicopters. In 1990, EMS helicopter ambulance service was available in 93 percent of the contiguous United States and 46 percent of Alaska (reference: Air Ambulance Helicopter Operational Analysis, DOT/FAA/RD-91/7). Over time, this coverage has continued to increase. Almost all of the aircraft used by these services are specially configured with advanced life support equipment and have crews who are highly trained in their use. These air medical services may already be part of the local emergency response system. Therefore, when it is necessary to transport trauma victims by aircraft, medically configured vehicles should be used. When the hospital-based EMS resources or city/county/state helicopter resources are overwhelmed either from patient transport or other support requirements as the Incident Commander has determined, it is time to implement the plan for "other" vertical flight aircraft participation.

g. Emergency Relief Worker Registration. It is important that all people who might be involved in emergency relief work be registered by their local emergency preparedness agencies prior to a disaster. The workers may then be covered under workmen's compensation laws and liability coverage. In addition, some sort of badge identification could be provided to indicate that the worker is registered.

h. Out of Scope. Certain planning aspects are outside the scope of these guidelines. These include charges for patient and passenger transport, protocols for determining a patient's destination hospital (other than those based on lifesaving reasons), insurance and liability for helicopter operations, and reimbursement for their operational costs. While these issues need to be addressed, they are best handled as normal business arrangements between interested parties. If aircraft support is requested by the Federal Government or under a State SARDA plan, the cost may be reimbursable.

6. POTENTIAL HELICOPTER AND TILTROTOR FLIGHT MISSIONS SUPPORTING DISASTER RELIEF EFFORTS. Examples of missions that vertical flight aircraft can perform are discussed below. Each community needs to assess the ways that vertical flight aircraft can support their unique relief requirements. All aircraft operators should be familiar with and comply with the FAA Federal Air Regulations (FAR) contained in Title 14 of the Code of Federal Regulations (CFR) that affect their operations under each of these potential mission types.

a. Transport of Medical Teams and Supplies to the Disaster Site. Vertical flight aircraft can transport medical teams and supplies from designated hospitals and/or trauma centers to the disaster site for triage and initial treatment of trauma victims.

b. Transuort of Medical Teams and Supplies to the Affected Hospitals. This involves the transportation of medical teams and supplies from predesignated hospitals, collection points, or supply centers to the primary receiving hospital(s) (usually closest to the disaster site or region) that may become overwhelmed with disaster victims. Be aware that medical personnel privileges generally do not transfer from one hospital to another. The emergency services coordinator in each state should be familiar with hospital policies on this issue. Prearranged permissions need to be addressed.

c. Transuort of Trauma Patients. The primary responsibility of EMS helicopters should be the transport of trauma patients. Many emergency plans suggest that the nearest hospitals to the incident be bypassed when helicopters are available. By taking patients to more distant medical facilities, it reduces the chance of overwhelming the closest hospital(s) with critical care patients. Helicopters can also perform hospital-to-hospital transfers to place patients in the most appropriate specialty treatment center.

d. Transuort of Disaster Specialists and Supplies. Vertical flight aircraft can transport disaster specialists and supplies to the disaster site or operations center where they can contribute most effectively to the relief effort. When ground transportation has failed, specialists and supplies can be picked up at predesignated assembly points. Specialists could include public safety employees: police, fire, and city/county emergency workers.

e. Emergency Evacuation. In both normal and disaster situations, vertical flight aircraft are used as an alternative to surface-based transport modes. In a high-rise building fire, they can be used to retrieve fire victims trapped on the roof when fire and smoke make elevators and stairways unserviceable. Similarly, fire fighters can be lifted to the roof for fire fighting and rescue operations. Vertical flight aircraft can pick up people stranded on car tops, rooftops, or in trees above swift floodwaters that no boat could navigate. In many cases, vertical flight aircraft may be the only means of

reaching and transporting both rescue workers and victims.

f. Damage Survey. A natural disaster, such as an earthquake, flood, or blizzard, may temporarily preclude the use of ground transportation. Vertical flight aircraft can be an extremely effective means to assess quickly the extent of damage so that authorities can implement plans for disaster relief effort. Information on the scope of the disaster can be transmitted to the command post via radio or video downlink.

g. Airborne Control and Assessment. It may be necessary to use a vertical flight aircraft or an airplane as a mobile aerial platform from which a deputy Incident Commander can observe and report on disaster response efforts. Conducting such operations with a small airplane will generally cost much less than using a vertical flight aircraft. However, vertical flight aircraft provide greater flexibility in the choice of landing sites.

h. Airborne Air Traffic Control (AATC). When more than four or five aircraft involved in the disaster relief effort, it may be advisable to assign one of the aircraft the mission of airborne air traffic controller. Depending on the nature of the operations and the proximity of aircraft to each other, an airborne aerial controller can significantly improve safety. In the Dallas/Ft. Worth area, the Helicopter Emergency Lifesaver Plan (HELP) designates the police helicopter as the aerial controller. The landing zone controller will also communicate with the aircraft to assist with safe landing and takeoff operations. See additional information in Chapter 4 - Communications and Chapter 5 - Landing Areas.

i. Electronic News Gathering (ENG). Disaster relief workers tend to regard ENG helicopters as a nuisance at best and downright dangerous at worst. However, there are at least two valuable services provided by ENG. First, real time aerial photography of the disaster scene can be transmitted to the ground. Disaster coordinators can use these photographs for damage assessment. They can "freeze frame" aerial photography and distribute photographs with annotations on where the relief activity should focus. Second, disseminating information to the public can help maintain confidence and morale. To encourage cooperation and efficient action, survivors need to know what is being done to affect their relief and what is expected of them. Friends and relatives outside the affected area need to know what is happening to people they love. This helps reduce community anxiety and lessen fears. For these reasons, relief personnel should give serious consideration to ENG helicopters and assignthem an appropriate priority in the vertical flight aircraft integration plan. They need to be assured of the opportunity to do their job and they should, in turn, assure compliance with the conditions and limitations imposed by the plan and by FAR 91.137, Temporary Flight Restrictions. In Hawaii, compliance with FAR 91.138, Temporary Flight Restrictions in Natural Disaster Areas in the State of Hawaii, may also be required.

j. Fire Fighting. Vertical flight aircraft have two primary functions in their roles as fire fighters. First, they are used to spray or drop fire retardants, chemicals, or water on the fire whether in a building or in a forest. This mission requires specialized training and specialized equipment. It is not recommended that unpracticed, unconfigured, volunteer aircraft be assigned to this mission. Fire departments, the U.S. Forest Service, and contract operators hired by the U.S. Forest Service are trained and equipped to support this mission. Second, vertical flight aircraft are used to transport fire fighters to sites from where they can fight the fire with conventional means. By landing on unobstructed high-rise rooftops or in clearings in the woods, normally configured vertical flight aircraft can be very useful as auxiliary transport for fire departments.

k. External-Load. If cargo is too bulky to fit inside a vertical flight aircraft, it may still be transported if its weight is within the aircraft's lifting capability. This is accomplished by slinging the cargo beneath the machine in a net or other containment device. Some vertical flight aircraft have a special hook apparatus mounted on their underside specifically for this purpose. The hook has safety devices that prevent inadvertent release of the load, and a special control whereby the pilot can release it in an emergency. The chief advantage of using vertical flight aircraft sling loads is the speed with which cargo can be picked up and set down. Vertical flight aircraft do not have to land in order to do either, but it is necessary to have a qualified ground crew at both ends of the trip to assist with cargo handling.

1. Security and Crowd Control. Police departments have long been aware of the effectiveness of helicopters in patrolling and surveillance work. Vertical flight aircraft may be even more effective performing this mission during a disaster situation because other modes of transportation may be severely curtailed. From aerial observation platforms, those responsible for security and the maintenance of law and order can watch for those who try to take advantage of the temporary disruption in police protection caused by the disaster. Vertical flight aircraft can spot open routes to safety and relay this information to traffic controllers on the ground. Also, it is advisable to transport a firefighter to the roof of a building being evacuated by vertical flight aircraft in order to maintain order and prevent panic among the occupants being rescued. This not only helps assure their safety, but that of the aircraft and crew as well.

m. Inspection Tours. Helicopters and tiltrotors may be used to transport Government representatives to inspect the disaster area, to assess the extent of damage, and to show their sympathy and concern for victims and survivors. Vertical flight aircraft offer a means to do so quickly and comfortably without interfering with the workers on the ground.

n. Hazardous Material Operations. In a hazardous materials situation, the Incident Commander should carefully review the use of all aircraft. Air operations over or near a

hazardous material spill can change the wind speed and direction thereby affecting the boundaries of dangerous areas. In addition, aircraft SHOULD NOT BE USED for removing "decontaminated" personnel from hazardous materials control areas because of possible "off-gassing" of contaminates. In the closed space of an aircraft, contaminates can have an adverse effect on flight crews and rescue personnel. Hazardous materials should be transported aboard aircraft only in accordance with 49 CFR Parts 171-18, the Hazardous Materials Regulations.

o. Search and Rescue (SAR) Missions. Normally, these missions would be handled by Civil Air Patrol (CAP), United States Coast Guard (U.S.C.G.), U.S. military, or public service (State Police) units. Those who regularly practice these types of operations with their own aircraft and crews are most likely to be integrated already into the existing disaster response plan. Additional vertical flight aircraft from the local community should only be used for SAR work in cases of extreme urgency and their efforts should be coordinated by the responsible SAR agency. The FEMA "Urban Search and Rescue Response System - Field Operations Guide" is a useful reference on this topic. Helicopters are often more effective than airplanes in finding missing persons since they can safely operate at 40 knots and 500 feet AGL. At 1000 feet and 90 knots, airplanes are usually more cost effective in finding downed aircraft.

p. Communications Support. In large-scale disasters, most forms of normal communications may be disabled for various periods of time. Helicopters can provide limited emergency communications (radio relay, message transport, etc.) and aid in reestablishing disabled communications systems by moving communications assets, repositioning/replacing antennas for cellular communications, etc.

q. Return of Personnel and Equipment. During a disaster, vertical flight aircraft may be used to return personnel and equipment to their respective bases. These missions may or may not be accorded a high priority, depending on individual circumstances, agreements, and orders of the Incident Commander. After a disaster, rescue equipment may not be returned to the owning department for several days or even weeks. At this point, ground transportation will most likely be used.

r. Livestock Support. The benefits of using vertical flight aircraft in disaster relief work are not limited to aiding people. Valuable livestock, stranded by snowdrifts or floodwaters, have been sustained with food transported by helicopters.

7. OPERATIONAL PRIORITIES. Helicopters and tiltrotors are extremely versatile aircraft and can be used to great advantage in many applications. Their versatility mandates that priorities be established as part of any vertical flight aircraft integration plan in order to assure that the most important jobs are accomplished on a timely basis. As vertical flight aircraft become available in a given emergency situation, they

need to be assigned the most critical missions first according to the needs of the Incident Commander (IC). Also, as more aircraft become involved in the relief effort, rights-of-way must be established so the various aircraft do not interfere with each other during their respective missions.

a. Safety. The number one priority in any aviation activity is safety. An all-encompassing, pervasive concern for safety in all aircraft applications will maximize the benefits derived from their use. Operators are responsible for compliance with FAA safety and air traffic regulations.

b. Mission Priority. Generally, the highest priority missions are in direct support of lifesaving efforts. Other missions may not be life critical, but they are important support functions that may be requested by the Incident Commander.

c. Consideration of Personnel on the Ground. Regardless of the mission type, it is imperative that missions be carried out so as not to impair the efficiency of workers on the ground or to endanger survivors or relief personnel.

8-19. RESERVED.

CHAPTER 2. PLAN PREPARATION

20. PLANNING ASSUMPTIONS. Four planning assumptions were made in formulating these guidelines:

a. Situational Problems. It is assumed that situational problems such as traffic, debris, floodwater, or location can interfere with deployment of ground transportation in the aftermath of any catastrophe, disaster, or mass casualty incident.

b. Timely Availability of Vertical Flight Aircraft. It is assumed that vertical flight aircraft will be available in a timely manner from various civil, private, and/or military sources.

c. Pre-existing Plans and the Incident Command System (ICS). 'It is assumed that participating municipalities have pre-existing disaster response plans or emergency plans in place and that they will either operate under the auspices of the Incident Command system (ICS) or another locally developed emergency response structure.

d. Control. Due to the limits imposed by weather and availability, helicopters and tiltrotors should not be considered an essential part of any plan. If the Incident Commander (IC) determines there is a requirement for their use and the community has vertical flight assets, then the vertical flight response plan can be activated. Spontaneous response by air resources with a sense of "just coming to help" can be counterproductive and should be strongly discouraged.

21. BASICS.

a. Acquire a Full Understanding of Existing Plans. The first step for a local emergency management planner in the integration of local vertical flight assets is to have a full understanding of any existing plans, agreements, regulations, and jurisdictional issues. Survey all operational procedures, mutual-aid agreements, service limitations, and regulations in the area of jurisdiction. [The quickest and most efficient way to gather this information is to contact your Local Emergency Planning Committee (LEPC), Regional Planning Committee (RPC), and regional FEMA office. See also Appendix A.] The goal is to integrate helicopters and tiltrotors into existing plans and Incident Command Systems, not to change the core of emergency planning that already exists. Once a familiarity of existing plans is acquired, it will be easier to incorporate the elements for vertical flight aircraft integration. Search out the air medical transport services in the region and encourage them to participate actively in the planning process.

b. Train First Responders in All Elements of the Plan. First respondrs who want to use helicopters and tiltrotors need to know how to obtain them, how to communicate with them, their landing zone requirements, and their safety requirements. The Incident Commander (IC) should be able to assess the emergency situation and determine whether helicopter or tiltrotor aircraft support is both necessary and available. Depending on

the scope of the incident, the IC may activate the air operations (AO) branch of the Incident Command System. Requesters and emergency operations personnel should first determine the adequacy of ground support as a means of mitigating or assessing the incident.

c. Establish a Central Control Point and Dispatch Center for All Helicopter and Tiltrotor Operations. Air operations control should normally be collocated with the primary emergency operations center or command post. Alternatively, air operations could be located separately in a facility that can handle all the parameters of flight operations. For example, the National Burn Victim Foundation (NBVF) in Basking Ridge, New Jersey uses the American Telephone & Telegraph (AT&T) Flight Operations Center to serve as its air operations (AO) center. The selected AO center should be in the communications network, have defined procedures and protocols, be able to file flight plans, provide weather briefings, and communicate with in-flight aircraft regarding mission assignments and estimated times of arrival (ETA). In addition, it should assign appropriate resources based on the requests of the Incident Commander.

22. ALERT LEVELS. It is recommended that different vertical flight aircraft alert levels should be defined based on the complexity of the anticipated disasters and the response time of the available aircraft. During a disaster, the Incident Commander will determine the appropriate alert level. Figure 2-1 provides one example of how vertical flight aircraft alert levels might be structured.

a. Level 1 could encompass locally available assets that could generally respond within two hours. First tier responders might include hospital-based EMS helicopters; city, state, and government assets; and local commercial and private helicopters.

b. Level 2 could reach to any State or National military resources that may be available within a two to six hour response time. U.S. Army National Guard (ARNG) helicopters may be a potential resource. These aircraft could be added to those responding under alert level 1.

c. **Level 3** helicopters and tiltrotor aircraft could be requested from reserve and active duty military installations. In mass evacuation situations, the military frequently has the largest available vertical flight aircraft and some can transport 20 or more people at a time. Level 3 aircraft may require over six hours to respond. (Emergency planners should be aware that once the Federal Response Plan has been implemented, Federal resources, including active military units, will not be available unless the State requests their support through the Federal Coordinating Officer at FEMA's Disaster Field Office.)

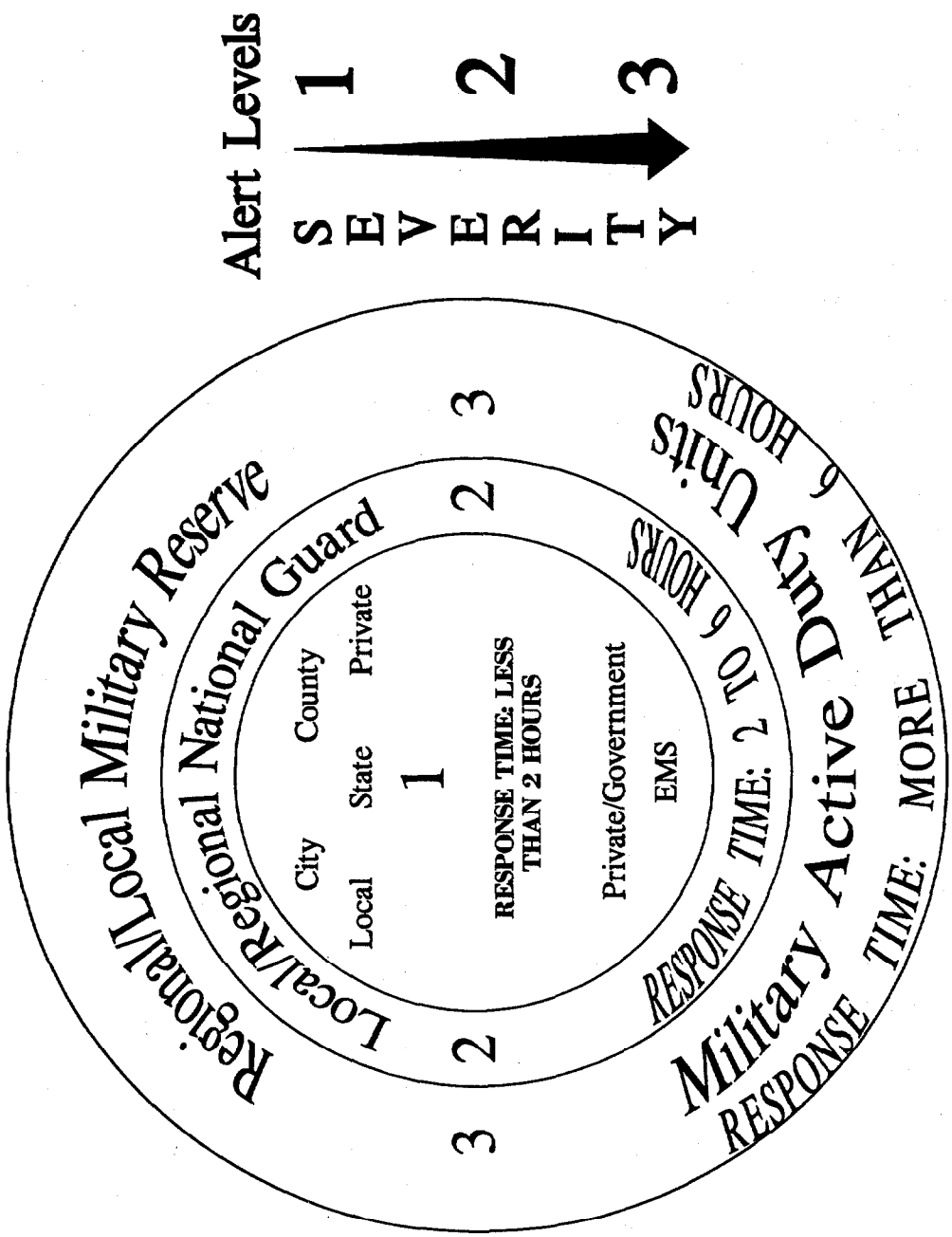


FIGURE 2-1. EXAMPLE - VERTICAL FLIGHT RESPONSE ALERT LEVELS

d. Commentary. Each locality and jurisdiction is unique. For example, some communities may be collocated with a major military installation that could provide a rapid response time. In such a case, military vertical flight assets might better be assigned to level 1 of the response alert. In addition, note that the response times given in this paragraph for levels 1, 2, and 3 are examples. Different times might be selected depending on local circumstances.

d. Notification and Request for Standby Status. When either level 1 or 2 is implemented, participants involved in the next higher level should be notified and asked to assume standby status.

e. Recognition of Existing Alert Systems. Many communities already have alert levels and corresponding checklists. Where such systems exist, vertical flight response levels should be integrated in a manner that is consistent with the planning doctrine. Some existing plans use more than three levels.

f. Maior Catastrophic Disasters. If the magnitude of the disaster warrants activation of the Federal Response Plan (FRP), Federal resources can only be acquired through the Federal Coordinating Officer (FCO).

23. SPECIAL RESPONSE PROCEDURES. It is appropriate to develop procedures for potential disaster scenarios in a particular region. These disasters could be among the following, depending on the community profile:

a. Natural Disasters Such as Hurricanes, Forest Fires. Tornadoes, Earthquakes, Floods, or Blizzards;

b. Airplane Crash at or Near a Local Airport;

c. Terrorist Incidents;

d. Hazardous Materials Spill; and

e. High Rise Building Fire.

Figure 2-2 provides a sample procedures outline for a high rise fire.

24. PLANNING VERSUS INTEGRATION. A deputy fire chief in Phoenix, Arizona has stated, "Planning is necessary and required, but often it is a paper plan on a shelf and unusable during an actual event. Experience has shown that the best disaster outcome has occurred in communities that have integrated helicopter operations into daily 'routine' operations and standard operating procedures. These procedures provided expansion capability and it became a natural act to expand to disaster level operations - rather than a foreign, unused plan. Integrating these procedures into the Incident Command System enhanced this 'routine' expansion capability."

25-29. RESERVED.

Fire Department(s)
- Conduct survey of all local high-rise building rooftops.
- Publish and distribute a directory with drawings, photos, etc. (Periodic review, validation, and revision of this directory are required.)
- Coordinate fire-fighting procedures with building management.
- Develop and train fire crews in operational procedures for helicopters (and tiltrotors if appropriate).
- Maintain equipment (rescue nets, rappelling gear, fans, etc.)
- Exercise crowd control on the rooftop during evacuation.

Vertical Flight Support Units
- Coordinate and cooperate with disaster planning agency.
- Maintain appropriate aircraft configurations.
- Conduct training and participate in full-scale exercises.
- Adopt specified safety and operational standards.

Police Department(s)
- Provide landing zone (LZ) security.
- Provide security in the vicinity of the fire site..
- Exercise crowd control at the fire site.

High-rise Building Management - in accordance with local codes.
- Review and agree to the provisions of the plans.
- Maintain available access to rooftop for evacuation.
- Maintain rooftop clear areas and/or emergency helipads.
- Notify fire department of changes and modifications.

FIGURE 2-2. SAMPLE HIGH-RISE FIRE RESPONSE PROCEDURES

CHAPTER 3. RESOURCE INVENTORY

30. INTRODUCTION. A key to the rapid and efficient deployment of helicopter and tiltrotor aircraft to support relief or rescue efforts is a list of commercial, private, government, and military operators who have agreed to commit aircraft. This chapter provides guidelines for developing a list of vertical flight assets and organizing that list to facilitate the dispatch of these aircraft to the scene.

31. IDENTIFY AND SURVEY HELICOPTER AND TILTROTOR OPERATORS. Initially, in obtaining commitments from vertical flight aircraft operators for disaster relief and rescue operations support, the planning agency should compile a list of area operators. Knowing who to call and the type of task that the aircraft will be performing will improve the efficiency of the response/rescue process.

a. Creating a Resource Inventory. The names of helicopter operators are available from several sources locally, regionally, and nationally. Consider starting with the organizations listed in Appendix A in order to reduce the time involved in seeking such information. You may be able to order lists from a combination of the organizations and to use the information to develop mailing and resource lists. In some cases, computer runs or membership rosters may be obtained free of charge. However, there may be a fee for this service.

b. Identify Civil Operators. The sources listed in Appendix A can provide names and contacts of civil helicopter operators who can aid in the development of this list. In particular, contact the air medical services organization(s) in your area. These operators usually know the other operators in the region and the services that each can provide. Encourage EMS operators to participate actively in your planning process.

c. Identify Military Operators. Each state has a National Guard Adjutant General (AG). This state-level AG can provide a listing of military vertical flight assets, both active and reserve, that are available within the state. In addition, the state-level AG provides a direct conduit for identifying and requesting military assets from other states and/or active military sources. Listed in Appendix A is the National Guard Adjutant General (AG) who can provide the address and phone number of the AG in each state.

32. RESOURCE SURVEY. Do not assume that every helicopter and tiltrotor operator within a region is willing to devote aircraft to support a relief operation on demand. Instead, develop a reliable resource list that can be used at the time of an emergency by surveying each operator in advance to determine the level of commitment and detailed information regarding available resources.

a. Survey. Conduct a survey of each helicopter and tiltrotor operator to obtain commitments and pertinent data regarding key personnel, bases of operations, types of aircraft, on-board communications and rescue equipment,

mission capabilities, and operational limitations. Organize this information into "assistance" categories as part of a resource inventory and request checklist. This will enable transportation and rescue requirements to be matched with an operator's capabilities (i.e., external-load for bringing in supplies or pulling debris from the disaster scene, litter configuration to carry victims from the scene, searchlight for nighttime damage assessment, etc.)

b. Limitations. The emergency planner must understand that HELICOPTERS AND TILTROTORS SHOULD ONLY BE ASSIGNED TASKS THAT THEY ARE CAPABLE OF PERFORMING. Operators may not be willing or able to provide aircraft support to perform all of the missions required for the relief effort. This may be due to schedule limitations (e.g., the aircraft is out on a current mission); by operational constraint (e.g., the pilot cannot perform the flight or the aircraft is down for maintenance); or by federal regulation or insurance limitations (e.g., the aircraft:
cannot perform sling loading, cannot transport patients by external-loads, or is not equipped to transport litters).
Special attention should be given to the types of services the aircraft operator is willing to provide. In addition, a procedure should be established for backup resources when or if an aircraft is unavailable.

33. TASK MATCHING. One of the objectives in a resource survey is to obtain an operator "profile" for "'task matching". This allows the air operations (AO) center to request aircraft support after considering the equipment and capabilities of specific aircraft. Figure 3-l is a sample helicopter and tiltrotor resource survey data form that can help in the data gathering effort. The types of data and a description of their purpose are listed below:

a. Name, address(es), and telephone number(s) of the operator's base(s) of operations. This information should also include fax numbers for immediate distribution of flight operations, E-mail address, and cellular telephone numbers in the event that land-line transmission becomes impossible.

b. Points of contact (should be on a 24-hour basis) and after-hours telephone number(s). Each contact person should be a key individual with authority to dispatch aircraft and staff support to the disaster scene.

c. Additional points of contact (in the event the first line of authority is unavailable). In some cases, the first point of contact may be unavailable and a'second in command will need to be identified. Think of a worst case situation (e.g., a holiday weekend) and list all available contacts.

Name of Operator: _____ Telephone Number: _____ Fax Number: _____

Address (or base of operations): _____

After-hours Telephone Number(If different than daytime phone): _____ Cellular Phone: _____

1st Point of Contact: _____ Telephone: _____

Must Have authority to dedicate helicopter resources to relief activity

2nd Point of Contact: _____ Telephone: _____

Must have authority to dedicate helicopter resources to relief activity if 1st point of contact is unavailable

Flight Operations Manager or Chief Pilot: _____ Telephone: _____

For Agency Use Only
Region: NW___ NE___
SW- SE -
Dispatched:
Yes___ No___
Launch Time:___:___
Return Time:___:___

List helicopters that company can dedicate to relief operations and complete or check relevant information:

Make and Model N#	Communications & Navigation	Base of Ops	# Crew / # Pax	# Litters that can be carried	Payload in Lbs	Response Time per 50 NM in Hrs/Mins	Duration of Flight Time in Hrs/Mins / Fuel Used	Special Equipment	Mission Capabilities	Helicopters dispatched	Cost per Hour
	VHF--- m - Loran___ RNAV___ Xpond___ GPS___		___				et A_____ 00 LL_____	Cargo Hook _____ Aerial Photo ___ Searchlight _____ FLIR _____ Public Address _____ Hoist _____ Emergency Med. Kit_____ Rescue N e t Other(list)_____	Passenger Only_____ Litter/Aeromed_____ External Load_____ Damage Assessment_____ Supplies_____	Date_____ Time Out_____ Mission _____ Time I _____ n Call S i g n	
	VHF-.-- m - - - - Loran___ RNAV___ Xpond___ GPS___		___ ___				fet A_____ 00 LL_____	Cargo Hook_____ Aerial Photo_____ Searchlight _____ FLIR_____ Public Address _____ Hoist Emergency Med. KitRescue N e t Other(list)_____	Passenger Only_____ Litter/Aeromed_____ External Load_____ Damage Assessment Supplies_____	Date _____ Time Out _____ Mission _____ Time In _____ Call sign _____	
	VHF___ UHF___ - - RNAV___ Xpond___ GPS___		___ ___				" A - 00 LL_____	Cargo Hook_____ A e r i a l P h o t o Searchlight _____ FLIR Public AddressH o i s t_____ Emergency Med K i t -Rescue Net_____ Other(list)_____	'assengers Only_____ Litter/Aeromed_____ External Load_____ Damage Assessment Supplies_____	Date_____ T i m e O u t - Mission _____ Time In _____ Call Sign _____	

Operational Limitations: Describe any limitations that might interfere with participation in the Disaster relief/rescue effort:
IFR Flight: Are helicopters/flight crew certified for IFR operations? Yes- No___.
Night Flight: Are there any missions that are prohibited for night flight? _____
Geographical(range of operations limitations)or Other Limitations: _____
Minimum Landing Area Requirements

FIGURE 3-1. SAMPLE HELICOPTER RESOURCE SURVEY DATA FORM

d. Name and telephone number(s) of flight operations manager and/or chief pilot. Information regarding aircraft mission(s), air traffic control, radio frequencies, flight hazards, landing zones, and traffic patterns should be transmitted to this individual in advance of dispatch if possible.

e. Number, make, and model of aircraft and their mission capability. licopter and tiltrotor aircraft, along with the registration or "N" number, should be listed. Additionally, identify the passenger capacity and any special equipment available so that the aircraft can be matched with the relief/rescue task.

f. Base of operations and response time per 50 nautical miles. In dispatching aircraft, their location in relation to the scene is a critical factor. Identify their operating bases and how long it will take the aircraft to arrive at the scene based on the block speed (lift-off to touchdown) of that particular aircraft. Consider this and the mission requirement that the aircraft will be performing when requesting helicopter or tiltrotor support. The response time should include engine start up, run up, etc.

g. Duration of flight. In making mission assignments, consider when refueling and change of aircrew will be required. Knowing the duration of flight will assist the AO director in programming resources over a given period of time.

h. Load Capacity.

(1) Passengers. Number of ambulatory (able to walk) passengers the aircraft can carry.

(2) Litter Patients. Number of litters the aircraft can accommodate.

(3) Pavload. Amount of weight, including both supplies and passengers, that the aircraft can safely carry under standard conditions, both internal and external (sling load), if appropriate.

i. Fuel reauirements. It may be possible to have a staging area close to the scene where aircraft can be refueled. A tanker truck carrying the required fuel such as Jet A or 100 Octane can be positioned at the staging area to eliminate time-consuming ferry flights back to an airport or operations base. If extended operations are planned, helicopter and tiltrotor operators may want to bring their own consumables (oil, hydraulic fluid, transmission fluid, etc.). Active and reserve military units have the capability to provide fuel transportation, storage, and dispensing equipment.

j. Size of landing area rewired. Helicopter and tiltrotor operators may require a landing area that is larger than what is recommended in AC 150/5390-2, Heliport Design. Note any special requirements.

k. Operational limitations. In operating helicopters and tiltrotors, there are several limitations that must be recognized:

(1) Geographical locations of the scene. A particular aircraft operator may not wish to operate outside a specified radius.

(2) Political. Jurisdictions or command hierarchies may require that certain aircraft resources be called out in a particular order such as police helicopters, first; hospital helicopters, second; private resources, third; Army National Guard, Army, or Coast Guard, fourth, etc. The order is likely to vary from jurisdiction to jurisdiction.

(3) Environmental. This field denotes whether a particular aircraft is certified for flight in inclement weather (winds, icing, reduced visibility, etc.) or whether the operator has a corporate/company policy of no instrument flight rules (IFR) operations or no nighttime flights. In addition, altitude and temperature restrictions are very important in many parts of the country.

(4) Personnel. Take into consideration that personnel must be qualified to conduct operations under the environmental' conditions.

(5) Mission. Some types of missions require specific FAA approval. For example, an operator must obtain FAA approval as an "FAR 133 operator" prior to conducting external-load operations.

1. Specialized equipment. Each operator may have the ability to perform a variety of tasks beyond carrying passengers. Often, this involves either special equipment or an aircraft configuration that is required for a special task:

(1) Searchlight. Used in night operations to locate victims, assess damage, spotlight potential landing areas or hazards that should be removed.

(2) Rescue net. Rescue net carried from a tether underneath the aircraft or a hoist (either externally or internally mounted).

(3) Rescue hoist. Many helicopters have a cable and winch system that allows the insertion and extraction of emergency personnel or the extraction of victims from areas where the helicopter is unable to land.

(4) Forward looking infrared (FLIR). Sensor used for locating victims, evaluating potential landing areas, etc.

(5) Cargo hook. Supplies can be carried outside the aircraft using a tether suspended from the cargo hook. This can be useful in areas where conditions prevent even a helicopter or tiltrotor aircraft from landing. Consult the FAR's for applicability.

(6) Aerial photographic pod. Useful for filming disaster scene for developing disaster relief control maps, pinpointing landing zones, identifying areas that need first priority for cleanup or rescue.

(7) Airborne data link. Some systems can provide two-way data link communications outside of VHF communications coverage.

(8) Automatic dependent surveillance (ADS) equipment is capable of providing low altitude service outside RADAR coverage. Several operators in the Gulf of Mexico have used ADS for flight following.

(9) Other special equipment. There may be other types of special equipment such as floats or rappelling devices. Each survey form should leave space for an operator to advise the agency of any of these other specialized capabilities that would enhance a rescue or relief mission.

m. Communications. There are four primary elements of communications requirements.

(1) On-board communications equipment. This includes UHF, VHF, cellular phones, FM radio, and video camera equipment. Civil and public service aircraft may have different types of avionics supporting either VHF (civil aviation) or UHF and FM (military aviation), or both. The airborne command/control aircraft should have the capability to transmit and receive all bands. One significant problem when using military aircraft is that most do not have radios that operate in the same frequency bands as the radios used by civil police and fire units. This can be compensated by the use of hand-held radios and/or auxiliary radios that attach to the helicopter's military radios.

(2) Ground communications equipment. This includes cellular phones, short-wave radio, and facsimile machines. In the event that regular telephone service is disrupted due to equipment problems, satellite communications or microwave cellular phones may bridge the disruption by maintaining phone communication to the aircraft base of operations. Internet E-mail may also provide an effective method of exchanging information.

(3) Emergency communications frequencies. Established emergency frequencies are needed for air operations, ground operations, and medical/rescue information exchange. The use of separate channels facilitates a more efficient management of aircraft operations and the medical/rescue network. Segregating the communications net helps prevent potential conflicts forced by sharing radio frequencies.

(4) Predetermined call sign assignment. The AO center will designate special call signs if the choice is made to use something other than the aircraft's registration number (N-number). (See also paragraph 46.)

34. SAMPLE SURVEY FORM. Figure 3-l illustrates a sample survey form. This is offered as a guide for the planning agency in developing a form tailored to its own emergency plan. Consider automating (computerizing) the completed data so that the information can be sorted using a variety of "fields". Example of such fields include region (NE, NW...), mission (supplies, medical, passenger...), special equipment (helicopters with "floats" for water rescue, FLIR for locating victims...), or disaster type (high-rise fire, earthquake, etc.). During an emergency, the ability to focus on relevant data can improve the efficiency of the response operation.

35. CONDUCTING THE SURVEY. Conduct a survey using the initial helicopter and tiltrotor inventory list developed from information received from one or more of the listed organizations. This activity could involve multiple steps in order to get a final list of participants.

a. Develop an initial list of helicopter and tiltrotor operators.

b. Create a survey form.

c. Mail or E-mail the survey form to operators with the following information:

(1) Cover letter describing the nature of the project.

(2) Deadline for responding (advise and highlight), and

(3) Contact person for answering questions or further describing the program

d. Receive the survey forms and, if necessary, retype information onto final form.

e. Send the operator a copy of the final aircraft inventory data form to verify the information.

f. Place the forms in a binder for the AO center. Organize the forms to match the task with the capability.

g. Establish a periodic review cycle for validating the currency of information and modifying it as required.

h. Make a determination on the registration of emergency workers and on whether reimbursement is appropriate and required.

36. VERIFYING AND UPDATING. The resource inventory will be a compilation of those data forms from operators willing to participate in disaster relief and rescue programs. Therefore, maintain only forms from committed operators in the disaster relief plan file. Have the operator verify the final data forms so that there are no transpositions, errors, or misunderstandings as to the operator's commitment and use of aircraft. The data forms can be updated by merely copying them and sending them to the individual operators for revision or continued commitment to the program. Creation of a computerized database can be a very efficient method for

maintaining and updating your data. Even greater efficiencies may be achieved if this file is accessible via the Internet for reference and updating.

37-39. RESERVED.

CHAPTER 4. COMMUNICATIONS

40. COMMUNICATIONS NETWORK. An effective communications capability is essential to deploying aircraft in support of emergency operations. This chapter focuses on the need and methodology for establishing a communications network to implement a vertical flight aircraft support plan for disaster relief.

41. TERMINOLOGY, PHRASEOLOGY. AND ACRONYMS. Each of the various groups in the disaster relief effort employs terms and phrases unique to their operation. Additionally, a specific acronym (abbreviation) does not always hold the same meaning for all responders. Thus, it is important to teach people to avoid the use of jargon and acronyms. This reduces the potential for misinterpretation.

42. ESTABLISH AN EMERGENCY COMMUNICATIONS NETWORK. From the initial aircraft request until completion of the mission, the flow of information is critical. Figure 4-l illustrates a communications network for requesting and managing helicopters and tiltrotor aircraft support. ONLY ONE ENTITY SHOULD BE RESPONSIBLE FOR DISPATCHING VERTICAL FLIGHT AIRCRAFT SUPPORT AND MANAGING THE ASSOCIATED RESOURCES. Information is relayed to the command post as the demand changes. Advisories that alter the level of support are relayed through the net on a continuing basis. The following is a brief explanation of the roles of each entity in the network.

a. Command Post. The command post (CP) is the initial contact point that receives notification of the disaster and requests activation of the disaster plan. Generally, this is the community's communications clearing house or an emergency number where alerts can be issued to authorities. As the plan is implemented and needs are identified, services are requested through the command post.

b. Incident Commander. In the USA, disaster relief efforts are often conducted using the Incident Command System (ICS). In this system, the Incident Commander (IC) is in charge of implementing the emergency operations plan. The IC notifies appropriate city/county staff and department heads of the action and requests their assistance in "turning on" various emergency operations. The IC or the delegated representative determines the need for aircraft support and provides information to the Air Operations (AO) center. This information includes:

(1) Type of disaster,

(2) Alert level,

(3) Location of disaster,

(4) Anticipated number of people requiring rescue or rapid transport,

(5) Types of helicopter and tiltrotor aircraft support needed,

(6) Locations of staging areas and/or landing zones,

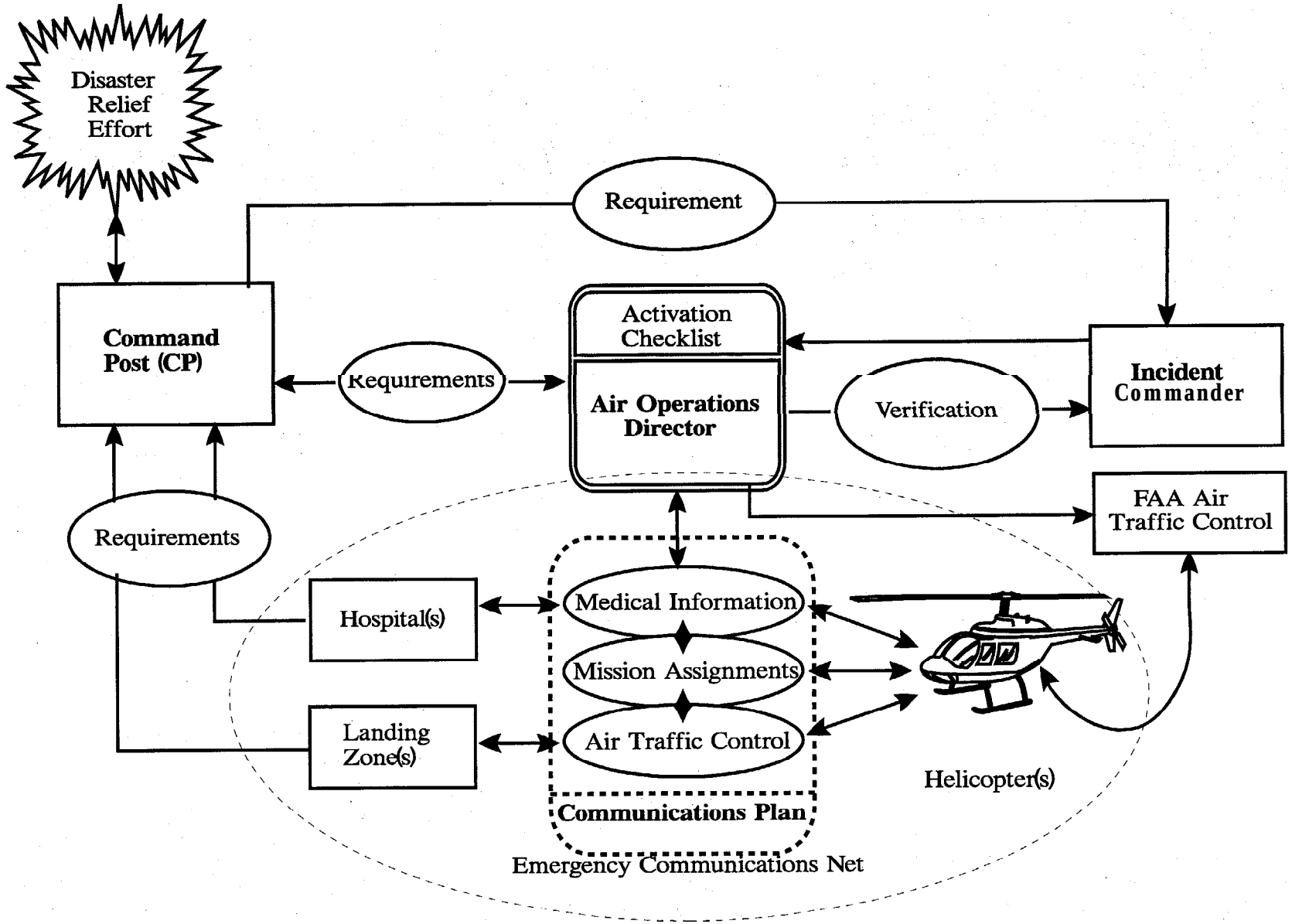


FIGURE 4-1. EXAMPLE - HELICOPTER AND TILTROTOR **COMMUNICATIONS** SYSTEM

(7) Weather at landing zone including wind speed and direction if possible, and

(8) Possible landing hazards.

c. Air Operations (AO) Center. The AO center will receive, then verify the request from the IC. Depending on the requirements, the AO center may then communicate with the command post for further operational and support requirements.

(1) The AO center director should be familiar with helicopter capabilities (and tiltrotor capabilities, if appropriate), able to weigh operational risks, and experienced in making decisions under pressure. The AO director is responsible for implementing the vertical flight aircraft communications plan.

(2) The AO center will advise, designate, or request air traffic control (ATC) assistance from the FAA or, if applicable, the airborne air traffic controller (AATC). In addition, the AO center will request vertical flight aircraft support; determine the types and numbers of aircraft needed; determine the anticipated duration of assignments; establish mission priorities; assess flight crew relief; organize ground support and security for helicopter and tiltrotor landing zones and staging areas; arrange for fuel trucks for sustained operations at staging areas; coordinate aircraft on the ground, in the air, at hospitals, and at staging areas; and disseminate information such as control maps, frequencies, geographical coordinates of landing zones and staging areas, hazards, call numbers and names of personnel in charge.

(3) In the event a heliport/vertiport directory does not exist, landing site information (latitude, longitude, approach azimuth, potential hazards, notable landmarks, etc.) will be given to pilots.

(4) The AO center continuously monitors activities of helicopter and tiltrotor crews, medical crews, hospitals, air traffic control, and command and control operations. The AO center assesses further operational requirements as disaster details become known and the relief/rescue effort progresses. Air operations may shift staging areas, casualty collection points, hospitals, and emergency landing zones as required.

d. Collocation. Whenever possible, the Command Post, the Incident Commander, and the Air Operation Center should be collocated.

e. Communications Plan. Smooth interactions among the medical and rescue units with helicopter and tiltrotor support activities and the prioritization of multiple relief requests comprise the most complicated and dynamic tasks of the communications plan. Ideally, the communications plan will help evaluate the initial estimation of damage and assignment of resources and will perform continuous

reassessment of these factors and their impact on the level of support. The information exchanged is the basis for making weighted control decisions regarding the resources required to mitigate the disaster. The communications plan is composed of at least three information components:

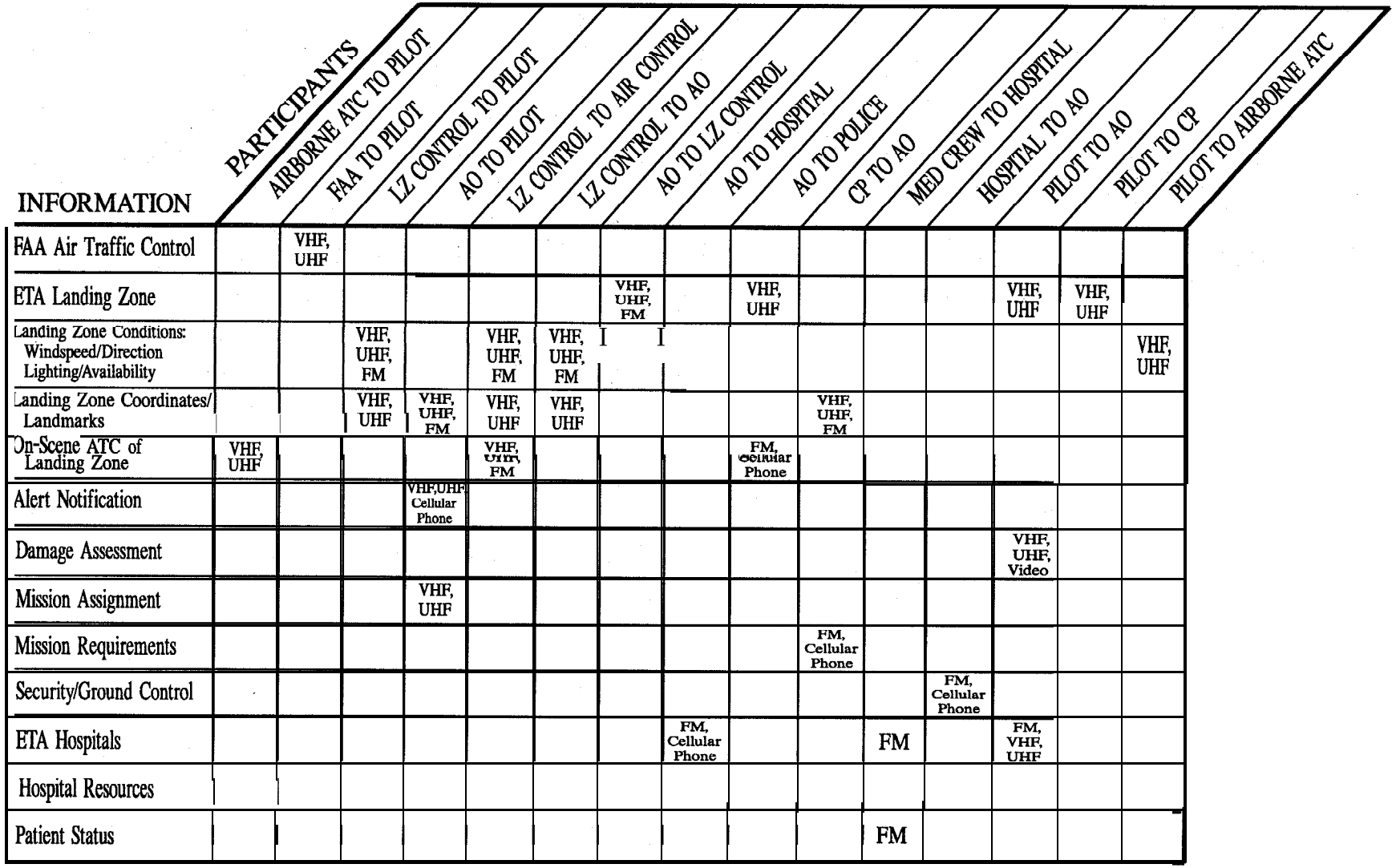
(1) Medical information. Medical tracking includes patient name, means of transport, medical status, and destination. The AO center assesses the requirements to transport medical personnel and special medical supplies or equipment. The AO also determines bed availability and assignment of receiving facilities. (Confidentiality dictates that patient names will not be broadcast unless there is some overriding reason to do so.)

(2) Mission assignments. Mission assignments include operations, landing zone designation, assessment of rescue efforts, and specification of disaster relief requirements.

(3) Air traffic control. ATC consists of information from the FAA and potentially an airborne air traffic controller (AATC, e.g., police helicopter, Civil Air Patrol airplane, etc.). When AATC services are required, this controller will advise and sequence helicopters and tiltrotor traffic in and out of the landing zone and staging areas. The AATC will receive requests from air operations regarding the distribution of outgoing aircraft to hospitals, staging areas, and landing zones. The AATC will also coordinate with FAA ATC as necessary. The FAA will control the restricted airspace, issue NOTAM's, and support the operations on a more general level.

f. Frequency Assignment. A key to information exchange is the establishment of separate, autonomous frequencies for medical, air, and ground operations. (A common frequency for use by all aviation personnel helps pilots to maintain the situational awareness required for safe operations. In addition, pilots need to be able to communicate, on an as-needed basis, with medical and ground operations personnel.) During .a disaster, frequency congestion can cause conflicts in transmitting vital information or impede traffic control. Among various operational components, it is important that there be discrete emergency frequencies dedicated to each function. The command post and the AO center should be able to monitor these frequencies simultaneously for reporting or requesting changes to the support levels. As hospital facilities approach saturation or as landing zone requirements are relayed to the command post, resources can be shifted or new demand levels can be established. Figure 4-2 summarizes some of the participants, the type of information being relayed, and the frequency ranges that are commonly used.

43. ESTABLISH PROCEDURES AND PROTOCOLS. Avoiding chaos and unnecessary radio traffic is one primary objective of writing and adopting a disaster relief plan. Determining who is in charge and what procedures should be carried out will help minimize the confusion that often accompanies a disaster.



INFORMATION	AIRBORNE ATC TO PILOT	FAA TO PILOT	LZ CONTROL TO PILOT	AO TO PILOT	LZ CONTROL TO AIR CONTROL	LZ CONTROL TO AO	AO TO LZ CONTROL	AO TO HOSPITAL	AO TO POLICE	CP TO AO	MED CREW TO HOSPITAL	HOSPITAL TO AO	PILOT TO AO	PILOT TO CP	PILOT TO AIRBORNE ATC
FAA Air Traffic Control		VHF, UHF													
ETA Landing Zone							VHF, UHF, FM		VHF, UHF				VHF, UHF	VHF, UHF	
Landing Zone Conditions: Windspeed/Direction Lighting/Availability			VHF, UHF, FM		VHF, UHF, FM	VHF, UHF, FM									VHF, UHF
Landing Zone Coordinates/ Landmarks			VHF, UHF	VHF, UHF, FM	VHF, UHF	VHF, UHF				VHF, UHF, FM					
On-Scene ATC of Landing Zone	VHF, UHF				VHF, UHF, FM				FM, Cellular Phone						
Alert Notification				VHF,UHF Cellular Phone											
Damage Assessment													VHF, UHF, Video		
Mission Assignment				VHF, UHF											
Mission Requirements										FM, Cellular Phone					
Security/Ground Control											FM, Cellular Phone				
ETA Hospitals								FM, Cellular Phone					FM, VHF, UHF		
Hospital Resources															
Patient Status										FM					

FIGURE 4-2. SAMPLE COMMUNICATIONS MATRIX

a. Written Procedures. Every jurisdiction and mission should have written, established procedures in place for the smooth coordination, control, and performance of rescue operations. Protocols should be specific to avoid misinterpretation of authority for

b. Organized Protocols. It is advisable that protocols be organized by disaster type, controlling agency, and the aircraft operators' mission capabilities. Protocols and procedures should focus on areas of information inherent in the communications net. In addition, regular exercise of the plan is just as important as plan development.

44. MEDICAL INFORMATION. Many types of medical information are critical to relief and rescue efforts including evaluation of injuries and special equipment needs. Information about the following may need to be communicated:

a. The command post or emergency operations center for alerting the medical community, i.e. hospitals, helicopter and tiltrotor operators, physicians, Red Cross, and volunteer agencies;

b. The disaster scene, including the location(s) of victims;

c. The medical control unit to request special equipment, to specify patient care, to transport requirements, and to relay changes in bed availability;

requesting resources and controlling various activities relating to the disaster scene. Because different types of disasters often dictate different requirements, the procedures should also be flexible to be responsive to the specific disaster at hand.

d. The triage area for treatment, stabilization, and priority for transport;

e. The landing zone for special transport instructions depending on the severity of injury;

f. The AO center to the receiving facility for patient condition updates, aircraft estimated time of arrival (ETA), bed availability, and en route care requirements; and

g. **The log book** for problems or deviations from established procedures including causes or rationale behind deviations and results. Pictures and video may enhance the recall process during a post-incident analysis.

45. MISSION ASSIGNMENT. AO center mission assignment functions may be ground-side or airborne depending on the resources available. Mission assignment duties are a command and control function that may encompass damage assessment, resource requirements and requests, air traffic control, and resource management. The AO director will do the following:

a. Manage emergency operations and aircraft mission assignments;

b. Determine the agency that will provide aircraft for use in AATC;

c. Prioritize activities based on alert levels (i.e., determine airspace requirements), advise the authorizing agency on the nature and extent of damages, and call for ground and airborne support, etc.;

d. Provide damage assessment and notify the IC/command post of resource requirements and available staging areas close to the scene;

e. Advise the IC/command post, manage resources as relief requirements shift geographically, adjust the response levels as the need diminishes; and

f. Maintain a log on problems or deviations from established procedures including causes or rationale. Pictures and video can enhance recall during post-incident analysis.

46. AIR TRAFFIC CONTROL. Air traffic control will likely be conducted using a local ATC facility, a temporary emergency ATC facility, an AATC, or a combination of these facilities. All air traffic issues should be coordinated with local FAA personnel during development of the disaster response plan(s). Procedures should include the following:

a. Determine the agency that will control air operations at the disaster scenes;

b. Coordinate with the FAA/ATC on when and where to "hand off' aircraft;

c. Provide "fixes" for landing zones or staging areas or advising air operations of landmarks for ground reference in locating the site(s);

d. Determine traffic flow and advise the command post and air operations of patterns in advance of dispatch, if possible;

e. Sequence aircraft for approach to landing zones or staging areas;

f. Control departing aircraft to a disaster support area, a receiving facility, or a hand-off point to FAA/ATC for further guidance to intended destination;

g. Control the flow of observation/surveillance aircraft or approved broadcast media aircraft within or around the disaster scene if allowed under 14 CFR 91.137, Temporary Flight Restrictions;

h. , Provide damage assessment to command post for further allocation or management of relief resources; and

i. Maintain a log on problems or deviations from established procedures including causes or rationale behind deviations and results - pictures and video may enhance the recall process during debriefing.

47. PREDETERMINED HELICOPTER AND TILTROTOR CALL SIGNS. Establish a procedure for determining helicopter and tiltrotor call signs that identify participating aircraft during a disaster activity and document it in the plan. This aids ATC personnel in separating the rescue aircraft from the general flow of traffic. ATC may be accomplished by the FAA ATC facility closest to the scene, by FAA Air Route Traffic Control Center (ARTCC) personnel, or by an airborne "air control" aircraft.

a. One method of designating call signs could use the last three digits of the aircraft's registration number, (e.g., N9465S), preceded by the identifier "Lifesaver" or "Rescue," resulting in the call sign, "Rescue 65-Sierra." (Sierra is the phonetic code for the letter S. The phonetic alphabet is used in all aviation call signs.)

b. Another means of assigning special call signs is to combine the aircraft role with part of its registration number and the number of persons the aircraft can rescue or transport. For example, if the aircraft registration number is N9465S and it can carry no litters and two passengers, the call sign would be "Lifesaver 5-Sierra-0-2."

c. Predesignation of Call Signs. Whenever possible, helicopter and tiltrotor aircraft will be preassigned a call sign for use during relief/rescue operations. The planning coordinator responsible for managing the aircraft inventory should advise the operators of the call signs when they are assigned and reconfirm them upon dispatch.

48. TEMPORARY FLIGHT RESTRICTIONS (TFR).

a. Federal Aviation Administration/Air Traffic Control (FAA/ATC). Federal Aviation Regulations 14 CFR Part 9 1.137 and, in Hawaii, 14 CFR Part 9 1.13 8 authorize the FAA to set aside airspace over the scene of an accident, disaster, or some other special event. This allows the FAA to route the normal flow of traffic away from the area. These regulations provide for the immediate establishment of temporary restricted airspace to provide a safe operating environment for disaster relief aircraft, among other reasons. It will be important for the AO center to determine the need for and the extent of restricted airspace through discussions with appropriate personnel. The AO center will request that the nearest FAA/ATC authority restrict the airspace involved. In making the request, the AO center must provide the FAA with the following information:

(1) Identify the reason for declaring FAR 14 CFR 91.137 (Temporary Flight Restrictions) or FAR 14 CFR 91.138, as appropriate,

(2) Identify the location by means of an azimuth and a distance (in nautical miles) from a ground-based navigational aid (accuracy is critical),

(3) Duration of expected restriction - a time frame can be estimated or the restriction can be active "until further notice," and

(4) Altitudes affected - these may be dictated by the nature of the disaster, winds, spatial arrangement and heights of buildings, number of aircraft needed for rescue operations, etc., and who will be directing relief activities.

b. Further information on the types of restrictions and related procedures is available in FAA AC No. 91-63, Temporary Flight Restrictions, and in FAA Handbook 7930.2 "Notices to Airmen," (See Chapter 8, Flight Data Center NOTAM Procedures, sections 8-1, b and 8-3). Avoid requesting a larger TFR than what is necessary. Once a TFR is requested, it may take 20 minutes to an hour or longer before it becomes effective.

c. Fragile Structures. Consider the case of a building, a highway overpass, or other structure that has partially collapsed due to an earthquake, a terrorist bomb, or some similar event. Such a structure is "fragile" in that further collapse could be caused by a relatively small outside force such as rotorwash or vibrations induced by aircraft noise. There may be victims, alive and dead, trapped within this structure. Rescue workers may be working to locate and extricate these victims. The FAA has received several UNCONFIRMED reports that helicopters may have caused the further collapse of such a fragile structure. Aircraft noise can also frustrate the efforts of rescue workers listening with highly sensitive sensors to locate victims trapped under the rubble. Planners and aircraft operators should be aware of these possibilities.

d. Protection of People in Fragile Structures. Temporary flight restrictions (TFR's) are an effective tool for protecting people from the risk of the further collapse of a fragile structure. TFR's should be sufficiently large to mitigate these hazards. However, airspace restrictions should not be so large that they interfere unnecessarily with valid and safe air operations. The variability and uncertainties of fragile structures do not lend themselves to a rigorous measurement of risk thresholds. However, a TFR that extends to 2000 feet above the ground and out to a radius of one nautical mile around the structure appears to provide reasonable protection without being excessive. Due to the limited field experience on this issue, the FAA is soliciting reports of both problems and successes in efforts to protect fragile structures during rescue operations. Send such reports FAA, General Aviation and Vertical Flight Program Office, AND-7 10,800 Independence Ave. SW, Washington DC 20591 and reference this AC.

49. DOCUMENTATION. Organization, education, and training are the keys to efficient disaster response. The emergency response plan will serve as a guide during times of emergency, as a training tool for new disaster relief personnel, and for exercises. The communications plan should be located in the overall disaster relief plan as a separate tabbed section. The following list details communication plan elements:

a. Definitions and acronyms for understanding disaster, aircraft,. medical, and radio terminology and phraseology;

b. Organizational flow chart, general description of responsibilities for each component of the communications network;

c. Step-by-step process in reauestine resources based on alert levels;

d. Telephone and radio freauencv lists of communications authorities by network component, participating helicopter and tiltrotor operators (including government flight operations), facsimile numbers, frequencies for UHF/VHF, FM, AM, short-wave, citizen's band, cellular telephone numbers, etc.;

e. Communications equipment reauirements for emergency use based on relief/rescue role;

f. Instructions on assigning call signs for new volunteer aircraft operators;

g. Sample briefing documents or forms that can be easily completed and hand delivered or Faxed to authorities, dispatch centers and/or aircraft operators;

h. Responsibilities and procedures for each participant in the disaster relief effort; responsibilities and procedures for each mission type for new participants; and

i. Distribution (to participants) of the control mans that can be marked up to identify staging areas, landing zones, or relief areas (see also Chapter 5).

CHAPTER 5. HELICOPTER AND TILTROTOR LANDING AREAS

50. INTRODUCTION. During a disaster relief effort, helicopter and tiltrotor operations will require the use of landing areas close to the scene. At locations other than airports, these can be one of several types of sites including: existing heliports or vertiports, predesignated emergency-use-only landing areas, or on-demand temporary facilities to be used specifically for relief activities. This chapter discusses the general criteria for establishing landing areas to be used by vertical flight aircraft.

a. Landing Site Selection. Before heliports, vertiports, and emergency landing sites can be established, it is necessary to determine specific site selection and/or approval criteria for such landing zones. This makes it possible to recognize candidate sites for designation as emergency-use-only landing zones and to standardize, to the extent possible, helicopter and tiltrotor emergency landing site facilities for maximum safety and utility.

b. Heliport and Vertiport Design. recommendations for heliport design and construction are contained in AC 150/5390-2, Heliport Design. FAA recommendations for vertiport design and construction are contained in AC 150/5390-3, Vertiport Design. These design ACs were developed by a Government/Industry working group and are intended to represent the MINIMUM REQUIREMENTS for a safe and functional heliport. It is within the prerogative of any jurisdiction to impose additional or more stringent criteria on heliport establishment over and above those contained in the AC. Further information on heliports and vertiports may be obtained from the resources listed in Appendix C.

c. Three Fundamental Reauirements. For safe operations at any helicopter or tiltrotor landing site, a pilot needs three things as listed below. Embellishments on these basic requirements are usually a function of the purpose of the facility, resources available to develop it, and how often it will be used. In a disaster situation with multiple helicopters and tiltrotors participating, it is highly desirable to have multiple approach and departure paths into the landing zone and multiple parking areas. This provides an increased safety margin, operational flexibility, and reduction in operational delay.

(1) Adequate clear airspace for approach and departure (with at least one, and preferably two, departure paths),

(2) Adequate clear space for expected ground maneuvers, and

(3) Adequate current information about wind speed and direction (a wind sock is the ideal source of such information).

51. SAFETY PERSPECTIVE. In disaster relief efforts, aircraft are sometimes sent on rescue missions that may involve life and death situations. Under such circumstances, pilots have been known to assume unusual risks willingly. Perhaps their thinking is that such risks are justified in the interest of saving lives. Unfortunately, however, such thinking may lead pilots to take unnecessary and inappropriate risks.

a. Community Resources. Lives may well be at risk during disaster relief efforts. Community resources are often stretched to the breaking point and beyond. This is a VERY BAD TIME for an aviation accident. Such an accident can bring to a halt the relief effort that the aircraft mission was supporting. It can also bring to a halt other relief efforts as it siphons off resources to deal with the aircraft accident. Thus, instead of bringing disaster relief assistance, an aircraft accident may require significantly more resources that the aircraft would have been able to deliver as an active part of the relief effort.

b. Safety is Paramount. In everyday operations, a pilot requires a certain amount of clear airspace to conduct approach and departure operations safely. In everyday operations, a pilot requires a certain amount of cleared space in order to conduct. ground maneuvers safely. A pilot also requires current information about wind speed and direction in order to operate safely at any landing site. Pilots do not need less clear airspace, less clear ground space, or less current wind information simply because a disaster has occurred. While a disaster may appear to turn the world upside down, the laws of physics still apply. Thus, in the selection of helicopter and tiltrotor landing sites, pilots should demand sites that provide at least the three basic design elements discussed in paragraph 50c.

52. SELECTION CRITERIA. The FAA Heliport Design Advisory Circular, AC 150/5390-2, contains detailed criteria for heliport design. The FAA Vertiport Design Advisory Circular, AC 150/5390-3, contains detailed criteria for vertiport design. What follows is a limited discussion of the basic points that should be considered when designing or designating helicopter and tiltrotor landing sites, regardless of whether the facility is permanent or temporary, extensive or simple.

a. Location. When selecting the location of an emergency-use landing zone, whether temporary or permanent, bear in mind the ultimate purpose of the facility. Landing zones near the disaster site and the emergency room entrance at the receiving hospital are most desirable, but not at the expense of safety, communications, and operations. The landing area at the scene should be placed sufficiently far away from activity centers that rotor-wash will not blow dust or supplies around and noise will not interfere with communications.

b. Approach and Departure Paths. all aircraft, helicopters and tiltrotors require clear airspace for safe operations during approaches and departures. In selecting landing sites, it is critical to choose locations that provide at least the minimum airspace recommended by the FAA. At landing sites, one of the most common helicopter accidents involves collisions with off-facility obstacles. Such accidents might involve a collision with a tower, trees, or a wire strike. These accidents can destroy the aircraft and injure the occupants. Selection of sites with additional airspace is encouraged because it provides an additional safety margin. Obstacles (buildings, antennas, wires, etc.) must not penetrate either the approach/departure surfaces or the transitional surfaces (see AC150/5390-2 and AC150/5390-3). Aircraft operate best when taking off or landing into the wind. Thus, while one approach/departure path may be acceptable at some locations, two or more paths are recommended as a way to provide greater safety and operational flexibility during varying wind conditions. Approach and departure paths should not pass over command posts, treatment areas, or operationally congested ground areas where rotorwash and/or noise may interfere with communications and operations.

c. Minimum Recommended Size - FATO. The minimum recommended size of the final approach and takeoff areas (FATO) is a function of the largest aircraft expected to use the facility (see AC150/5390-2). (Keep in mind that the largest helicopter may be a military aircraft such as the UH-1 or the UH-60 Blackhawk.) At landing sites, the most common helicopter accidents involve collisions with obstacles. Such accidents might involve a main rotor hitting a wire or pole, a tail rotor strike, or catching a helicopter skid on some very short object. All of these accidents have the potential to destroy the aircraft. Choosing and designing landing sites that exceed the minimum requirements can increase the safety margin.

d. Minimum Recommended Size - Safety Area. For safe operations, the size of the safety area around the FATO (see AC 150/5390-2) is a function of the largest helicopter expected to use the facility (Consider both civil and military helicopters as appropriate.). The safety area provides clearance between the edge of the FATO and buildings, trees, fences, telephone poles, wires, hillsides, or anything else that could be struck by main or tail rotors. Increasing the minimum tip clearance between helicopter rotors and objects that could be hit can increase the safety margin. This is particularly a concern for objects that are hard to see, such as wires, or things whose color allows them to blend into the background when visibility is poor. For nighttime operation at a temporary or unimproved landing site, a minimum tip clearance of 40 feet is recommended.

e. Wind Indicator. At a landing zone, a means of informing the pilot of the wind velocity and direction is essential. The recommend means is a wind sock. (At facilities that are only used during disasters, acquire wind socks that can quickly be installed on a temporary basis.). Placement is critical, particularly if the landing site is located near a building. Locate the wind sock so that it does not to interfere with flight operations while still giving a true indication of wind speed and direction. In areas with swirling or varying winds, such as near buildings or in mountainous areas, two or more carefully placed wind socks may be required to accomplish this. At landing sites, one of the more common helicopter accidents involves inaccurate or unavailable information on wind direction and speed. Such accidents might involve a hard landing due to an unexpected tail wind or a collision with an improperly located wind indicator. The use of properly located wind socks is recommended because it provides an additional safety margin. For night operations, a lighted wind sock should be used. Care should be taken to ensure that this lighting is installed in a way that does not degrade a pilots' night vision.

f. Surface Slope (in degrees). The landing surface should be flat (no bumps or depressions) and level or as near level as possible, but in no case should the slope exceed 10 degrees from the horizontal.

g. Surface Composition. Landing surfaces should be capable of supporting one and one-half times the heaviest helicopter's maximum takeoff weight and should be skid-resistant. All helicopter and tiltrotor landing areas should be free of dust, loose dirt, other forms of loose debris and objects, and gravel smaller than one and one half inches in diameter. (Rotor-wash can pick up and throw small gravel at a significant speed.) Turf landing zones are quite suitable, but vegetation should be no higher than 12 to 18 inches in height. Wheeled helicopters are especially sensitive to soft landing surfaces. For control of dust in dirt areas, a helpful practice is to wet down the landing area using a hose before landing operations begin.

h. Obstructions and Obstacles. Within the FATO; lights, tie-downs, etc. should be flush with the surface. Obstacles, such as signs, poles, light fixtures, or fire extinguishers should be kept well clear of helicopter and tiltrotor maneuvering areas. This is particularly relevant for those objects that are difficult to see from the air, such as power lines, telephone lines, guy wires, and poles that blend into the background. Obstructions should be noted to pilots and, for night operations, should be lighted in a way that will not interfere with the aircrew's night vision. Ball markers can be an effective means for marking obstacles such as power lines and guy wires.

i. Lighting. Lighting systems are necessary to support night operations, but usually, the installation of permanent lighting. systems is only practical at permanent landing sites. Portable lighting systems are commercially available and can be used at temporary facilities. Flares, vehicle lights, and other light sources may be acceptable field expedients if trained personnel deploy them under very carefully controlled circumstances. To avoid the temporary destruction of the pilot's "night vision," special care must be taken in the placement and orientation of lighting.

j. Security. For permanent sites, fences and/or hedges can effectively restrict inadvertent or unauthorized access to heliports and helipads, but they must not present a hazard to flight operations. It is absolutely essential to have specially trained personnel responsible for security at temporary landing zones. Confusion and excitement can create dangerous situations for persons on the ground as well as for aircraft using the facility. For on-the-scene landing areas, an effective barrier of vehicles or very secure rope can aid in keeping the flow of relief activity away from the operational area.

k. Triage Areas (if appropriate). The primary concern in establishing a temporary landing zone to support disaster relief efforts should be aeronautical safety and efficiency of operations. On the other hand, in disaster situations, high priority is always placed on saving lives and relieving suffering of the casualties. Therefore, emergency landing zones should be situated close to triage areas in order to facilitate and expedite patient transport. However, their location should be chosen so that aircraft operations do not interfere with the efforts of triage and medical teams, do not further endanger the victims, and do not add to patient discomfort with noise, rotorwash, and flying debris.

1. Logistical Support. Long term operations require support in the areas of fuel, maintenance, flight crew food, fluids, rest, etc. Planning must reflect these needs and provide a means of obtaining the necessary resources. These logistical support requirements are built into the Incident Command System.

m. Another Reference. During the 1980's and 1990's, the FAA published several dozen reports dealing with heliport/vertiport design and planning. Many of these reports deal with research that sought to validate specific heliport design requirements. A concise summary of these various efforts is contained in the FAA report Safe Heliports Through Design and Planning, A Summary of FAA Research and Development, FAA/RD-93/17. Heliport and vertiport planners and designers should take advantage of this summary as a quick way to become familiar with the results of numerous research projects.

53. **SURVEYS AND INVENTORY.** Once site selection criteria are established, it then becomes possible to survey, inventory, and catalog all of the existing and potential landing sites. The first step is to locate and identify all existing local aviation facilities that are capable of supporting aircraft operations. Specific attention should be paid to:

a. Public-use Heliports, Vertiports, and Airports,

b. Private-use Heliports, Vertiports, and Aimorts, and

c. Hospital Heliports.

54. SURVEY OF EXISTING AVIATION FACILITIES. In responding to a specific disaster, there may be multiple locations available for use as an aviation staging area. The choice of the "best" location can be made on a quicker and more reliable basis if the deciding official has rapid access to current information on the available facilities. (See also FAA ACOO-7, State and Regional Disaster Airlift (SARDA) Planning, for additional guidance on this issue.)

a. Location and Services. With regard to existing facilities, it is important to note not only their location, but the services, supplies, and other aviation amenities they may have to offer. Of particular interest is the availability of aviation fuel. Regularly published Flight Information Publications (FLIP) are excellent sources of information on existing facilities, and are readily available from the FAA and the National Oceanic and Atmospheric Administration (NOAA).

b. Medical or First Aid Facilities. Another area of interest is the medical or first-aid facilities located nearby and the direction, distance, and recommended routes to and from the nearest hospitals and trauma centers. Many air medical transport services have already surveyed their regions and developed "predesignated landing zones." Such listings, where available, can be very helpful. Provide this last information to all police and fire units, as well as all ambulance services-in the area.

c. Hotels and restaurants. Survey and document motels and restaurants adjacent to aircraft landing sites. This information can be essential in supporting relief personnel for extended operations during a lengthy relief effort.

d. Constraints Posed by Annual Events. Facility XYZ may be ideal as an aviation staging area for almost any disaster in a particular county. However, consider that this may be the location of a high-priority annual event (state fair, Kentucky Derby, Indianapolis 500, etc.) that is likely to take place even in the face of a disaster. Such events and their time schedules should be documented so that disaster relief planners can consider choosing the second-best staging area during the time of this annual event.

55. SPECIAL ARRANGEMENTS WITH HELIPORT OWNERS AND OPERATORS. If private-use heliports are to be incorporated into the disaster response plan, it will probably be necessary to make special arrangements with the owners or operators. Usually, there are significantly more private-use heliports than public-use heliports in any given area. Thus, the use of such special arrangements may yield a broader-based heliport system that can better meet the needs of the community in the event of a disaster. This may also prove useful during lesser emergencies.

56. DEVELOPMENT OF PUBLIC-USE HELIPORTS AND VERTIPORTS. In many parts of the country, the number or distribution of landing sites in the area is inadequate to meet the requirements of the planned disaster response. Where this is the case, make a concerted effort to develop public-use heliports and vertiports to assure that they are established where they are needed. Not only would such a program enhance the community's ability to respond to disasters, but it would also provide business and transportation benefits to the public under normal, everyday conditions. Under the auspices of the FAA's National Plan of Integrated Airport Systems (NPIAS), the FAA's Airport Improvement Program (AIP) can provide grants of up to 90 percent for planning and construction of public-use heliports, vertiports, and airports. For assistance in developing public-use heliports and vertiports, contact the FAA Regional Heliport Coordinator (see Section 2 of Appendix A), the state aviation department, and the local (city or county) planning department.

57. PREDESIGNATION OF EMERGENCY-USE-ONLY LANDING SITES. It is advisable to pre-designate as many emergency-use-only landing zones as possible in parks, ball fields, parking lots, vacant lots, etc. This will augment the network of established landing facilities and expand the coverage of a potential vertical flight response. The same set of site selection criteria should be applied to the choice and designation of these sites as suitable emergency landing fields and helicopter and tiltrotor staging areas. For area hospitals with small (or no) helipads on the premises, sites to handle overflow aircraft operations should also be identified and designated as auxiliary landing zones. These may include sites that can be temporarily blocked off in nearby fields, parking lots, and roads.

58. DOCUMENTATION OF LANDING SITES. As the existing and potential landing zones in the jurisdiction are being identified, it is then necessary to document them. Collect the pertinent data and consolidate them in a directory to be used by helicopter and tiltrotor pilots. Include photographs and/or drawings of the rooftops of all high-rise buildings in the area that are beyond the reach of ground-based fire fighting and rescue apparatus. Local helicopter pilot organizations or operators will usually be happy to assist in putting this information into a standardized form. Prepare a directory of maps and charts, drawings and/or aerial photos of landing zone locations and layouts and send copies to all concerned. Revise and distribute this document as often as

necessary to keep pace with new construction and other geographical changes. Consider the use of a computerized database for greater efficiency in using and updating these data.

59. RESERVED.

CHAPTER 6. PLAN ACTIVATION, TRAINING/EXERCISES, AND POST-INCIDENT ANALYSIS

60. INTRODUCTION. Once the plan has been developed, it is critical that it be tested several times before being implemented. Problems need to be identified and corrected with each exercise or actual event. Test all disaster response plans on a regular basis.

61. ACTIVATION CHECKLIST. Follow an activation checklist for both exercises and actual events. The common elements to plan activation are the following:

a. **Notification of Helicopter and Tiltrotor Support Reauirements bv a Designated Activation Authoritv,**

b. **Activation of the Air Operations (AO) Branch,**

c. **Activation of the Log or Record Book,**

d. **Determination of Alert Level bv Type of Response Reauired,**

e. **Inclusion Into the Emergency Onerations Network,** and

f. **Notification of Alert Level to Responders.**

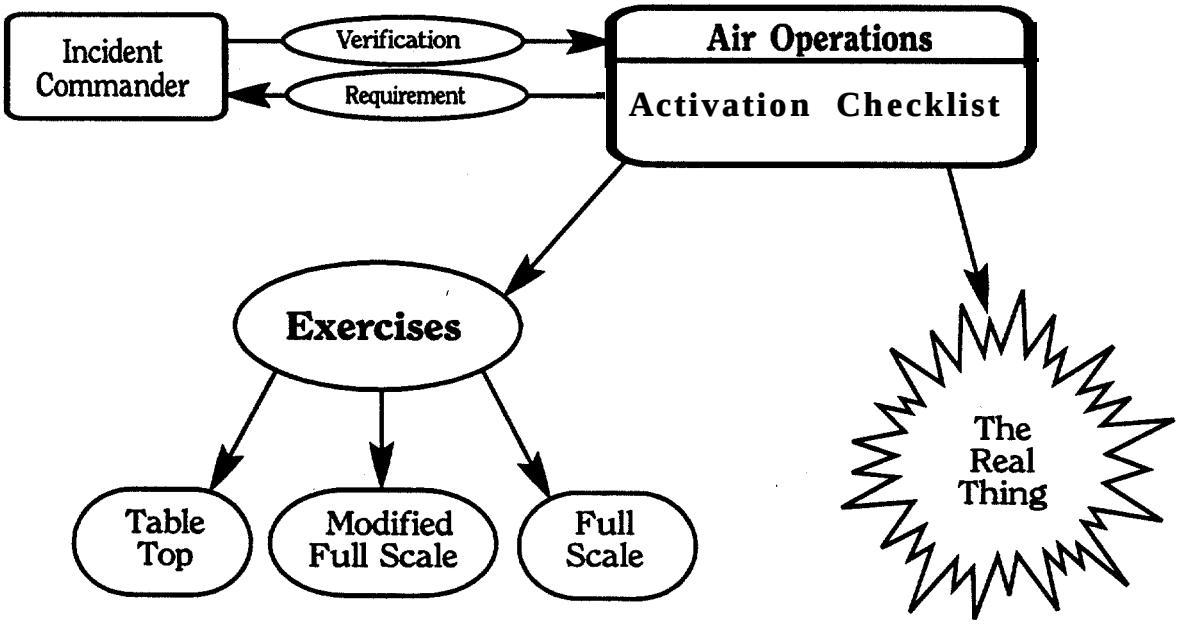


FIGURE 6-L PLAN ACTIVATION

62. THE NEED FOR TRAINING/EXERCISES. Disaster preparedness officials have long recognized the value of good training and regular exercises. When a sophisticated piece of equipment such as a helicopter is involved, include it in the testing of the emergency response system. Experience is the best teacher. Most of the principles of disaster planning are based on the sometimes painful lessons learned under actual catastrophic conditions. Like combat for soldiers, disaster situations test not only courage, stamina, and resourcefulness, but also the applied knowledge and acquired skills of the disaster response personnel. Obviously, waiting for disasters to happen in order to test their response effectiveness is just as unacceptable as waiting until wartime to evaluate military capability.

63. THE VALUE OF TRAINING/EXERCISES. The military has also recognized the value of exercises for training troops and determining the level of their effectiveness and readiness. Exercises provide the opportunity to learn how to best employ helicopter and tiltrotor assets in realistic and controlled settings that are relatively free of risk. When working with **aircraft,** repetitive exercises first teach and then ingrain specific responses to specific situations by non-aviation people, As a result, they become confident of their own skills and abilities, as well as those of the aircraft pilots and operators. The responders are therefore better able to react effectively to unforeseen complications. The observation and

skills and abilities, as well as those of the aircraft pilots and operators. The responders are therefore better able to react effectively to unforeseen complications. The observation and analysis of their response to simulated situations will indicate where corrective actions are needed. At the same time, these exercises instill confidence on the part of others in the community who learn that they can rely on aircraft for support in their time of need.

64. REALISTIC EXERCISE SCENARIOS. The first step in setting up a good training exercise is to develop a plausible and useful disaster scenario that tests the effectiveness of the local plan or a specific portion of it. The disaster situation should simulate realistic disaster occurrences such as hurricanes in South Florida or severe blizzards in North Dakota. For example, when you practice for a blizzard, conduct your exercise during the winter while there is snow on the ground. Practicing for blizzards in July does not contribute to learning about winter operations and their unique characteristics. Aircraft-based exercises are invaluable in the experience they lend to disaster workers.

65. EXERCISE SCHEDULES AND OBJECTIVES. Regardless of the scenario, it is important to publicize the schedule and objectives of the exercise well in advance so that helicopter and tiltrotor operators and others can be prepared to accurately evaluate their performance. Unexpected or surprise exercises may have some value in

testing response times, but generally they are to be avoided if the overall objective is training or determining readiness. National Fire Protection Association (NFPA) Standard 424; FAR 14 CFR Part 139, Certification and Operations: Land Airports Serving Certain Air Carriers, particularly paragraph 139.325 concerning the Airport Emergency Plan; and FAA AC 00-7, State and Regional Disaster Airlift Planning, can serve as a guide for incorporating helicopter and tiltrotor operations into airport and community disaster exercises. It is essential to continually maintain logs of all exercise events in order to document fully the strengths and weaknesses experienced. Once operational proficiency is demonstrated, then the participants can be included in the plan.

66. THREE TYPES OF EXERCISES. Conduct exercises involving the use of aircraft as often as possible at one of three levels. There are advantages and disadvantages to each type of exercise and the final decision regarding which type to hold and how often to hold them should be left to the community planners.

a. Table-Top Exercises. This type of exercise tests the communications network necessary for effective use of helicopters and tiltrotors in disaster response. They can identify deficiencies in response capabilities, but they only test the effectiveness of the model, not the "real thing." Table-top exercises have the distinct advantage, however, of being the least expensive and least time-consuming of all the exercise formats. As an example, consider a county-level exercise attended by the county's chief executive officer, the heads of the county's operational organizations, representatives from key disaster organizations, the chief financial officer, and the county's legal counsel. With an experienced emergency management officer as moderator, this group can focus solely on policy issues and discuss the legal, financial, political, and practical implications of various disaster relief choices. In a few hours, the group can learn how good policy choices can avoid expensive and embarrassing problems during disaster relief efforts.

b. Modified Full-Scale Exercises. Very realistic exercises, that are nevertheless modified in order to save money and reduce risk to the participants, can effectively test the readiness and efficiency level of specific phases of the local disaster response. One variation of this type of exercise alerts all helicopter and tiltrotor operators (according to the alert level of the scenario) and brings them to full readiness but does not actually execute the full response capability of the plan, or only does so partially. Once realistic response times are known, other modified exercises can be held to test other parts of a given disaster scenario.

c. Full-Scale Exercises. Realism is the key to success in this type of exercise, but providing it can be expensive and time consuming. While there is always a certain amount of real risk associated with a full-scale response to a simulated situation, these exercises have the potential to provide the best possible training. This type of exercise is also an excellent way to expose weaknesses and deficiencies that cannot be anticipated in any other format. There are two basic types of full-scale exercises:

(1) Single point exercise. This type of exercise tests the ability of many organizations and people to work together in a small area (example: single city or county exercise in response to a mass casualty incident such as a high-rise fire or a train crash).

(2) Wide-spread exercise. This type of exercise tests the command and control structure (example: multi-county exercise in response to an earthquake or flood).

67. TRAINING PROGRAMS. Both ground and flight personnel require regular training on tasks they might be required to perform during emergency operations. Military, government, and corporate flight organizations normally maintain a formal training program for their flight personnel. Local emergency planners should contact these organizations and request that tasks applicable to the local emergency plan be incorporated into these training programs.

68. POST-INCIDENT ANALYSIS. One of the most important functions dealing with emergency preparedness is the post-incidentanalysis. The ability to identify, analyze, and correct any problems or deficiencies is critical to the successful integration of helicopters and tiltrotors into the planning process.

a. Post-Incident Debriefing. It is recommended that debriefings of disaster workers occur as they come off shift or at the conclusion of the relief effort. The agencies that participated in the plan should be required to fill out an evaluation form or, at the very least, speak to a debriefer. Perhaps as a precursor to any stress debriefings that may occur, the disaster workers could be debriefed on their participation in the plan. The participants should be requested to contribute to the documentation of what happened during the incident and to supplement the record and log book information.

b. Post-Incident Analysis Checklist. Briefly, planners should:

(1) Debrief personnel,

(2) Review log books and other documentation,

(3) Identify the aspects of the effort that functioned well,

(4) Commend people for their efforts,

(5) Identify deficiencies, and

(6) Implement' corrective action(s).

APPENDIX A. RESOURCE INVENTORY SOURCES

Section 1. FAA Flight Standards District Offices (FSDO's) and Field Offices (FSFO's) Please be aware that phone numbers and addresses change over time. d this occur with the office of interest, contact your telephone directory assistance or call one of the other FSDO offices and ask for the new phone number or address needed.

Alabama
Birmingham FSDO
Liberty Park, Bldg., 1500
1500 Urban Center Drive
Birmingham AL 35242
205-731-1640

Alaska
Anchorage FSDO
45 10 International Airport Road
Suite 302
Anchorage AL 99502
907-271-2000

Fairbanks FSDO
6450 Airport Way
Fairbanks AL 99709
907-474-0276

Juneau FSDO
1873 Shell Simmons Drive
Juneau AL 99801
907-586-7532

Arizona
Scottsdale FSDO
Scottsdale Municipal Airport
15041 N. Airport Drive
Scottsdale AZ 85260
602-640-256 1

Arkansas
Little Rock FSDO
170 1 Bond Street
Little Rock AK 72202-5733
501-918-4400

California
Fresno FSDO
4955 E. Anderson Avenue
Suite 110
Fresno CA 93727-l 573
209-487-5306

Long Beach FSDO
Long Beach Airport
5001 Airport Plaza Dr., Suite 100
Long Beach CA 90815
562-420-l 755

El Segundo FSDO
2250 E. Imperial, Suite 140
El Segundo CA 90245
310-215-2150

Oakland FSDO
85 17 Earhart Rd., Suite 100
Hangar 5, Oakland Airport
Mail: P.O. Box 2397 Airport Station
Oakland CA 94621
510-273-7155

Riverside FSDO
Riverside Municipal Airport
6961 Flight Road
Riverside CA 92504
909-276-6701

Sacramento FSDO
Sacramento Executive Airport
6650 Belleau Wood Lane
Sacramento CA 95822
9 16-422-0272

California (continued)
San Diego FSDO
8525 Gibbs Drive, #120
San Diego CA 92 123
619-557-5281

San Jose FSDO
San Jose Airport/Jet Center
1250 Aviation Ave., Suite 295
San Jose CA 95110-1130
408-291-7681

Van Nuys FSDO
Skylane Building
16501 Sherman Way, Suite 330
Van Nuys CA 91406
8 18-904-629 1

Colorado
Denver FSDO
26805 E. 68th Avenue
Suite 200
Denver CO 80249-63 6 1
303-342-l 100

Connecticut
Windsor Locks FSDO
Building 85-214
Bradley Int'l Airport
Windsor Locks CN 06096
860-654-l 000

Florida
Fort Lauderdale FSDO
1050 Lee Wagener
Suite 201
Fort Lauderdale FL 333 15
954-356-7526

Miami FSDO
5600 N.W. 36th Street
Suite 334
Miami FL 33159
305-526-2572

Miami Springs FSDO
5600 N.W. 36th Street
Suite 466, P.O. 661566
Miami Springs FL 33266
305-526-2761

Orlando FSDO
5950 Hazeltine National Drive
Suite 500
Orlando FL 32822-5023
407-8 16-0000

Tampa FSDO
5601 Mariner Street
Balboni Blvd., Suite 3 10
Tampa FL 33609
813-639-1540

Georgia
Atlanta FSDO
170 1 Columbia Avenue
College Park GA 30337-2747
404-305-7200

Hawaii
Oahu FSDO
135 Nakolo Place, Rm: 215
Island of Oahu
Oahu HI 96819
808-837-8300

Idaho
Bosie FSDO
3295 Elder Street
Airport Plaza, Suite-350
Bosie Idaho 83705-4712
208-334-9261

Illinios
Chicago FSDO
DuPage Airport
3 1 W775 North Avenue
West Chicago IL 60 185
630-443-3 100

Illinios (continued)
Schiller Park FSDO
9950 West Lawrence Ave, Suite 400
Schiller Park IL 60 176
847-67 l-0078

Springfield FSDO
Capital Airport
3 North Airport Drive
Springfield IL 627078417
217-744-1910

Indiana
Indianapolis FSDO
Indianapolis Int'l Airport
8303 W. Southern Avenue
Indianapolis IN 4624 1
3 17-487-2400

South Bend FSDO
1843 Commerce Drive
South Bend IN 46628
2 1 g-236-8480

Iowa
Des Moines FSDO
3021 Army Post Road
Des Moines IA 50321
5 1 s-285-9895

Kansas
Wichita FSDO
Mid Continent Arpt. FAA Bldg.
1801 Airport Road, Rm 103
Wichita KS 67209
3 16-941-1200

Kentucky
Louisville FSDO
Watterson Towers, 1 lth Floor
1930 Bishop Lane
Louisville KY 402 18
502-582-594 1

Louisiana
Baton Rouge FSDO
Local Coordinator, Ryan Field
9191 Plank Road
Baton Rouge LA 708 11
504-358-6800

Maine
Portland FSDO
Portland Int'l Jetport
2 Al McKay Avenue
Portland ME
207-780-3263

Marvland
Glen Burnie FSDO
890 Airport Park Road, Suite 101
Cromwell Business Park
Glen Burnie MD 21061-2559
4 1 o-787-0040

Massachusetts
Bedford FSDO
Civil Air Terminal Bldg
Second Floor, Hanscom Field
Bedford MA 01730
781-274-7130

East Boston FSDO
Logan Int'l Airport
1 Harborside Drive
East Boston MA 02128
617-561-5789

Michigan
Belleville FSDO
Willow Run Airport-East Side
8800 Beck Road
Belleville MI 48111
734-487-7222

Grand Rapids FSDO
Kent County Int'l Airport
FSDO Bldg, 5500 44th St., S.E.
Mail: FAA FSDO, P.O. Box 888879
Grand Rapids MI 49588-8879
616-954-6657

Minnesota
Minneapolis FSDO
Minneapolis-St. Paul Int'l Airport
6020 28th Ave., South, Rm: 201
Minneapolis MO 55450
612-713-4211

Mississippi
Jackson FSDO
120 North Hangar Dr., Suite C
Jackson Municipal Airport
Jackson Miss 39208
601-965-4633

Missouri
Kansas City FSDO
10015 N. Executive Hills Blvd.
Kansas City MO 64153
816-891-2100

Saint Louis FSDO
FAA Building
1080 1 Pear Tree Lane, Suite 200
Saint Arm MO 63074
314-429-1006

Montana
Helena FSDO
2725 Skyway Drive, Suite 1
Helena Regional Airport
Helena Montana 596012
406-449-5270

Nebraska
Lincoln FSDO
Lincoln Municipal Airport
General Aviation Building
Lincoln NE 68524
402-437-5485

Nevada
Las Vegas FSDO
6020 S. Spencer Ave., Suite A-7
Las Vegas NV 89119
702-388-6482

Reno FSDO
4900 Energy Way
RenoNV89502
702-858-7700

New Jersey
Teterboro FSDO
Teterboro Airport
150 Fred Wehran Drive, Room 1
Teterboro NJ 07608
201-393-6700

New Mexico
Albuquerque FSDO
1601 Randolph Rd., Suite 200N
Albuquerque NM 87 106
505-764- 1200

New York
Albany FSDO
7 Airport Park Blvd.
Albany NY 12110
5 18-785-5660

Farmingdale FSDO
Administration Building, Suite 235,
7 150 Republic Airport
Farmingdale NY 11735- 1583
516-755-1300

Garden City FSDO
990 Stewart Avenue, Suite 630
Garden City NY 11530-4858
5 16-228-8033

New York (Continued)
Rochester FSDO
1 Airport Way, Suite 110
Rochester NY 14624
716-955-4100

North Carolina
Charlotte FSDO
4700 Yorkmont Road, Room 203
Charlotte NC 28208
704-344-6488

Winston-Salem FSDO
8025 North Point Blvd.
Suite 250
Winston Salem NC 27 106
910-631-5147

North Dakota
Fargo FSDO
Hector Airport
1801 N. 23rd Ave., Rm: 216
Fargo ND 58 102
701 232-8949

Ohio
Cincinnati FSDO
Lunken Airport Exec., Bldg.,
4240 Airport Road
Cincinnati OH 45226
513-533-8110

Cleveland FSDO
Cleveland Hopkins Int'l Airport
Federal Facilities Bldg., Suite 131
Cleveland OH 44135
216-265-1345

Columbus FSDO
Port Columbus Int'l Airport
3939 Int'l Gateway, 2nd Floor
Columbus OH 432 19
614-237-1039

Oklahoma
Oklahoma City FSDO
The Parkway Bldg
1300 S. Meridian, Suite 601
Oklahoma City OK 73 108
405-95 l-4200

Oregon
Hillsboro FSDO
Portland-Hillsboro Airport
1800 N.E., 25th Ave., Suite 15
Hillsboro Oregon 97 124
503-68 l-5500

Pennsvlvania
Allentown FSDO
961 Marcon Blvd, Suite 111
Allentown PA 18 103
610-264-2888

Harrisburg FSDO
Capital City Airport, Room 10 1
400 Airport Drive
Harrisburg PA 17070-2489
7 17-774-8271

Philadelphia FSDO
International Plaza #2
Suite 110
Philadelphia PA 19 113
610-595-1500

Pittsburgh FSDO
Graham Building, Suite 300
3000 Lebanon Church Road
West Miffm PA 15 122-2630
412-466-5357

Puerto Rico
San Juan FSDO
Plaza Los Americas, Roosevelt Ave,
Los Torre de Plaza
Suite 90 1, Hato Rey
San Juan Puerto Rico 00918
787-764-2538

South Carolina
Columbia FSDO
Foreign Trade Zone
103 Trade Zone Drive, Suite 30-C
Columbia SC 29170
803-765-5931

South Dakota
Rapid City FSDO
4200 Airport Rd
Suite 50
Rapid City SD 57701-8703
605-393-1359

Tennessee
Memphis FSDO
3385 Airways Boulevard
Suite 115
Memphis TN 38116
901-544-3820

Nashville FSDO
2 International Plaza Drive
Suite 700
Nashville TN 37217
615-781-5437

Texas
Dallas FSDO, Local Coordinator
3300 Love Field Drive
Mail: Lock Box 5
Dallas TX 75247
241-767-5850

Dallas Ft. Worth FSDO
DFW Business Center
South Tower Suite 400
DFW Airport TX 75261
972-456-6900

Fort Worth FSDO
Local Coordinator, Alliance Airport
2260 Alliance Blvd.
Fort Worth TX 76 117-4300
817-491-5000

Houston FSDO
Local Coordinator
13 100 Space Center Blvd.
Suite 5400
Houston TX 77059-3398
281-212-9700

Lubbock FSDO
Lubbock Int'l Airport, S. End
Old Terminal Bldg
Mail: Route 3, Box 51
Lubbock TX 7940 l-97 12
806-740-3800

San Antonio FSDO
10 100 Reunion Place
Suite 200
San Antonio TX 78216-4118
210-308-3300

Utah
Salt Lake FSDO
116 North 2400 West
Salt Lake City UT 84116
80 l-524-4247

Virginia
Richmond FSDO
Richmond Int'l Airport
5707 Huntsman Rd, Suite 100
Richmond VA 23250-2415
804-222-7494

Washington DC
Washington FSDO
GT Building, Suite 112
600 West Service Road
Falls Church VA 20041-0325
703-661-8160

Washington State
Seattle FSDO
1601 Lind Ave., S.W.
Renton WA 98055-4056
425-227-28 13

Washington State (continued)
Spokane FSDO
6 13 3 East Rutter Avenue
Spokane WA 992 12
509-353-2434

West Virginia
Charleston FSDO
Yeager Airport
301 Eagle Mountain Rd, Rm: 144
Charleston WV 253 11
304-347-5 199

Wisconsin
Milwaukee FSDO
49 15 South Howell Avenue
Milwaukee WI 53207
414-747-553 1

Wvoming
Casper FSFO
951 Werner Court, Suite 320
Casper WY 82601
307-26 l-5425

Section 2. FAA Regional Heliport Development Coordinators

The FAA has designated Regional Heliport Development Coordinators to assist in carrying out mission responsibilities in the area of heliport planning and development. These coordinators are listed below.

FAA New England Region
Heliport Coordinator (ANE-6 10)
12 New England Executive Park
Burlington MA 0 1803
617-238-7610, 238-7600

FAA Northwest Mountain Region
Heliport Coordinator (ANM-6 10)
1601 Lynd Avenue, SW
Renton WA 98055-4056
206-227-2608, 227-2600

FAA Eastern Region
Heliport Coordinator (AEA-6 10)
Fitzgerald Federal Building
John F. Kennedy International Airport
Jamaica NY 11430
718-553-3336, 553-3331

FAA Central Region
Heliport Coordinator (ACE-6 10)
601 East 12th Street, Federal Building
Kansas City MO 64 106
816-426-4783, 426-4698

FAA Southern Region
Heliport Coordinator (ASO-620)
PO Box 20636
Atlanta GA 30320
404-305-6722

FAA Western Pacific Region
Heliport Coordinator (AWP-6 10)
PO Box 92007, World Postal Center
Los Angeles CA 90009
3 10-725-3618

FAA Great Lakes Region
Heliport Coordinator (AGL-6 10)
2300 East Devon Avenue
Des Plaines IL 600 18
847-294-753 8

FAA Alaskan Region
Heliport Coordinator (AAL-6 10)
222 West 7th Avenue, Box 14
Anchorage AL 995 13
907-27 l-5459

FAA Southwest Region
Heliport Coordinator (AS W-620)
Fort Worth TX 76193-0620
8 17-222-5650

Section 3. Additional FAA Sources of Information

Federal Aviation Administration
800 Independence Avenue SW
Washington DC 2059 1

Emergency Operations Staff (ADA-20)
202-267-3523

General Aviation and Vertical Flight Program Office (AND-710)
202-493-4685

Flight Standards Service
Technical Programs Division (AFS-400)
202-267-8452

National Flight Data Center (ATA- 110)
202-267-93 10

General Aviation and Commercial Division (AFS-800)
202-267-8212

Office of Airport Planning and Programming, National Planning Division (APP400)
202-267-345 1

Office of Airport Safety and Standards, Design and Operations Criteria Division (AAS- 100)
202-267-7669

Section 4. Federal Emergency Management Agency

FEMA HEADQUARTERS

National Emergency Coordination Center (24-hour) 202-898-6100
(can locate FEMA personnel during off-duty hours)

HQ Operations Division (normal duty hours) 202-646-2508
FAX 202-646-4336
HQ Mailing Address: FCP 602,500 C. Street, SW., Washington, DC 20472

FEMA REGIONAL OFFICES

Region I (Boston)
(States: CT, ME, MA, NH, RI, VT)
Regional Director
J.W. McCormack Post Office
and Court House, Room 442
Boston Massachusetts 02109-4595
Phone: 617-223-9540
FSN: 551-9540
FAX: 617-223-9519

Region II (New York]
(States: NJ, NY, PR, VI)
Regional Director
26 Federal Plaza, Room 1337
New York NY 10278-0002
Phone: 212-225-7208
FSN: 532-7208
FAX: 212-225-7245

Region III (Philadelphia)
(States: DE, DC, MD, PA, VA, WV)
Regional Director
Liberty Square Bldg. (2nd Floor)
105 So. Seventh St.
Philadelphia PA 19106-3316
Phone: 215-931-5608
FSN: 553-5500
FAX: 215-931-5513

Region IV (Atlanta)
(AL, FL, GA, KY, MS, NC, SC, TN)
Regional Director
1371 Peachtree Street, N.E., Suite 700
Atlanta GA 30309-3 109
Phone: 404-853-4200
FSN: 554-4200
FAX: 404-853-4230

Region V (Chicago)
(States: IL, IN, MI, MN, OH, WS)
Regional Director
175 W. Jackson Blvd. (4th Floor)
Chicago IL 60604-2698
Phone: 312-408-5501
FSN: 555-5501
FAX: 312-408-5234

Region 'VI (Denton)
(States: AR, LA, NM, OK, TX)
Regional Director
Federal Regional Center
800 N. Loop 288, Room 106
Denton TX 76201-3698
Phone: 817-898-5104
FSN: 536-5104
FAX: 817-898-5325

Region VII (Kansas City)
(States: IA, KS; MO, NB)
Regional Director
Old Federal Office Bldg.
911 Walnut St., Room 200
Kansas City MO 64 106-2085
Phone: 816-283-7061
FSN: 537-7061
FAX: 8 16-283-7504

Region VIII (Denver)
(States: CO, MT, ND, SD, UT, WY)
Regional Director
Denver Federal Center
Bldg. 710, Box 25267
Denver CO 80225-0267
Phone: 303-235-48 12
FSN: 538-4312
FAX: 303-235-4976

Region IX (San Francisco)
(States: Amer. Samoa, AZ, CA, Guam, HI, NV, Commonwealth of No. Mariana Islands, Federated States of Micronesia, Republic of Marshall Islands, Republic of Palau)
Regional Director
Bldg. 105, Presidio of San Francisco
San Francisco CA 94129
Phone: 415-923-7100
FSN: 539-7100
FAX: 415-923-7112

Region X (Seattle)
(States: AK, ID, OR, WA)
Regional Director
Federal Regional Center
130 228th St. SW
Bothell WA 9802 l-9796
Phone: 206-487-4604
FSN: 530-4604
FAX: 206-487-4622

Section 5. State Emergency Management Directors

Alabama Emergency Management Agency
5898 County Road 41
P.O. Drawer 2 160
Clanton, Alabama 35045-5 160
(205) 280-2201
FAX: 280-2410

Alaska Division of Emergency Services
P.O. Box 5750
Fort Richardson, Alaska 99505-5750
(907) 428-7039
FAX: 428-7009

Arizona Division of Emergency Services
5636 East McDowell Road
Phoenix, Arizona 85008
(602) 23 l-6245
FAX: 231-6356

Arkansas Office of Emergency Services
P.O. Box 758
Conway, Arkansas 72033
(501) 329-5601
FAX: 327-8047

California Office of Emergency Services
2800 Meadowview Road
Sacramento, California 95832
(916) 262-1816
FAX: 262-l 677

Colorado Office of Emergency Management
Division of Local Government
Department of Local Affairs
15075 South Golden Road
Golden, Colorado 80401-3979
(303) 273-1622
FAX: 273-1795

Connecticut Office of Emergency Management
Department of Public Safety
360 Broad Street
Hartford, Connecticut 06105
(203) 566-4343
FAX: 247-0664

Delaware Emergency Management Agency
P.O. Box 527
Delaware City, Delaware 19706
(302) 834-453 1
FAX: 326-6045

D.C. Office of Emergency Preparedness
2000 14th Street, NW, 8th Floor
Washington, D.C. 20009
(202) 727-6161
FAX: 673-2290

Florida Division of Emergency Management
2740 Centerview Drive
Tallahassee, Florida 32399-2 100
(904) 413-9969
FAX: 488-1016

Georgia Emergency Management Agency
P.O. Box 18055
Atlanta, Georgia 303 16-0055
(404) 624-7000
FAX: 635-7205

Hawaii State Civil Defense
3949 Diamond Head Road
Honolulu, Hawaii 968 16-4495
(808) 734-2161
FAX: 733-4287

Idaho Bureau of Disaster Services
4040 Guard Street, Bldg. 600
Boise, Idaho 83705-5004
(208) 334-3460
FAX: 334-2322

Illinois Emergency Management Agency
110 East Adams Street
Springfield, Illinois 6270 1
(2 17) 782-2700
FAX: 785-6043

Indiana Emergency Management Agency and Department of Fire and Building Services
302 West Washington Street
Room E-208
Indianapolis, Indiana 46204-2760
(3 17) 232-3980
FAX: 232-3895

Iowa Division of Emergency Management
Department of Public Defense
Des Moines, Iowa 503 19
(515) 281-3231
FAX: 281-7539

Kansas Division of Emergency Preparedness
2800 S.W. Topeka Boulevard
Topeka, Kansas 66611-1287
(913) 274-1401
FAX: 274-1426

Kentucky Disaster & Emergency Services
EOC Building
Boone National Guard Center
Frankfort, Kentucky 4060 l-6 168
(502) 564-8682
FAX: 564-8614

Louisiana Office of Emergency Preparedness
P.O. Box 44217
Baton Rouge, Louisiana 70804
(504) 342-1583
FAX: 342-547 1

Maine Emergency Management Agency
State Office Building, Station 72
Augusta, Maine 04333
(207) 287-4080
FAX: 287-4079

Maryland Emergency Management Agency
2 Sudbrook Lane, East
Pikesville, Maryland 2 1208
(410) 486-4422
FAX: 486-l 867

Massachusetts Emergency Management Agency
400 Worcester Road
P.O. Box 1496
Framingham, Massachusetts 0 170 1-0317
(508) 820-2010
FAX: 727-4764

Michigan Division of Emergency Management
300 South Washington Square
Suite 300
Lansing, Michigan 48913
(517) 334-5103
FAX: 333-4987

Minnesota Division of Emergency Management
Department of Public Safety
B-5, State Capitol
75 Constitution Avenue
St. Paul, Minnesota 55155-1001
(612) 296-0450
FAX: 296-0459

Mississippi Emergency Management Agency
P.O. Box 4501
Fondren Station
Jackson, Mississippi 39296-4501
(601) 352-9100
FAX: 352 -83 14

Missouri Emergency Management Agency
P.O. Box 116
2302 Militia Drive
Jefferson City, Missouri 65 102
(314) 526-9146
FAX: 634-7966

Montana Division of Disaster and Emergency Services
1100 North Main
P.O. Box 4789
Helena, Montana 59604-4789
(406) 444-69 11
FAX: 444-6965

Nebraska State Civil Defense Agency
National Guard Center
1300 Military Road
Lincoln, Nebraska 68508-l 090
(402) 471-7410
FAX: 471-7433

Nevada Division of Emergency Management
Capitol Complex
2525 South Carson Street
Carson City, Nevada 897 10
(702) 687-4989
FAX: 687-6788

New Hampshire Governor's Office of Emergency Management
State Office Park South
107 Pleasant Street
Concord, New Hampshire 03301'
(603) 271-2231
FAX: 225-734 1

New Jersey Office of Emergency Management
P.O. Box 7068, Old River Road
West Trenton, New Jersey 08628-0068
(609) 538-6050
FAX: 538-0345

New Mexico Division of Emergency Management
Department of Public Safety
P.O. Box 1628
Santa Fe, New Mexico 87504- 1628
(505) 827-9222
FAX: 827-3456

New York State Emergency Management Office
22 Security Building, State Campus
Albany, New York 12226-5000
(5 18) 457-9996
FAX: 457-9995

North Carolina Division of Emergency Management
116 West Jones Street
Raleigh, North Carolina 27603
(919) 733-3718
FAX: 733-5406

North Dakota Division of Emergency Management
P.O. Box 5511
Bismarck, North Dakota 58502-55 11
(701) 328-3300
FAX: 328-2119

Ohio Emergency Management Agency
2825 W. Dublin Granville Road
Columbus, Ohio 43235-2206
(614) 889-7150
FAX: 889-7183

Oklahoma Department of Civil Emergency Management
P.O. Box 53365
Oklahoma City, Oklahoma 73 152
(405) 521-2481
FAX: 521-4053

Oregon Division of Emergency Management
595 Cottage Street, NE
Salem, Oregon 973 10
(503) 378-2911 ext 225
FAX: 588-1378

Pennsylvania Emergency Management Agency
P.O. Box 3321
Harrisburg, Pennsylvania 17 105-332 1
(717) 783-8016
FAX: 65 l-7800

Rhode Island Emergency Management Agency
State House, Room 27
Providence, Rhode Island 02903- 1197
(401) 421-7333
FAX944-1891

South Carolina Emergency Preparedness Division
Office of the Adjutant General
1429 Senate Street
Columbia, South Carolina 2920 1
(803) 734-8020
FAX: 734-8062

South Dakota Division of Emergency Management
500 East Capitol
Pierre, South Dakota 5750 l-5070
(605) 773-3233
FAX: 773-3580

Tennessee Emergency Management Agency
3041 Sidco Drive
P.O. Box 41502
Nashville, Tennessee 3 7204- 1502
(615) 741-6528
FAX: 242-9635

Texas Division of Emergency Management
Department of Public Safety
P.O. Box 4087, North Austin
Austin, Texas 78733-0001
(5 12) 465-2443
FAX: 424-2444

Utah Division of Comprehensive Emergency Management
State Office Building, Room 1110
Salt Lake City, Utah 84114
(801) 538-3400
FAX: 538-3770

Vermont Division of Emergency Management
Waterbury State Complex
103 South Main Street
Waterbury, Vermont 0567 l-2 10 1
(802) 244-872 1
FAX: 244-8655

Puerto Rico Civil Defense Agency
Office of the Governor
P.O. Box 5127
San Juan Puerto Rico 00906
(809) 724-0124
FAX: 725-4244

Virgin Isiands Office of Civil Defense
and Emergency Services
102 Estate Atmon
St. Croix, Virgin Islands 00820
(809) 773-2244
FAX: 774-1491

Virginia Department of Emergency
Services
3 10 Turner Road
Richmond, Virginia 232256491
(804) 674-2497
FAX: 674-2490

State of Washington
Military Department
Emergency Management Division
P.O. Box 40955
Olympia, Washington 98504-0955
(206) 459-9191
FAX: 923-4591

West Virginia Office of Emergency
Services
Main Capitol Building, Room EB-80
Charleston, West Virginia 25305-0360
(304) 558-5380
FAX: 344-4538

Wisconsin Division of Emergency
Government
2400 Wright Street
P.O. Box 7865
Madison, Wisconsin 53707
(608) 242-3232
FAX: 242-3247

Wyoming Emergency Management
Agency
P.O. Box 1709
Cheyenne, Wyoming 82003
(307) 777-4900
FAX: 635-6017

American Samoa Territorial Emergency
Management Coordination
Department of Public Safety
P.O. Box 1086
Pago Pago, American Samoa 96799
(011)(684) 633-233 1
FAX: (684)633-2300

Guam Division of Civil Defense
Emergency Services Office
P.O. Box 2877
Agana, Guam 969 10
(011)(671) 477-9841
FAX: (671)477-3727

Civil Defense Coordinator
Mariana Islands Office of Civil Defense
Capitol Hill
Saipan, Mariana Islands 96950
(011)(670) 322-9529
FAX: (670)322-2545

Civil Defense Coordinator
Republic of the Marshall Islands
P.O. Box 15
Majuro, Republic of the Marshall Islands
96960
(011)(692) 730-3232
FAX: (692)625-3649

Office of the President
P.O. Box 490
Kolonia, Pohnpei - Micronesia 96941
(0 11)(691) 320-2822
FAX: (691)320-2785

Palau NEMO Coordinator
Office of the President
P.O. Box 100
Koror, Republic of Palau 96940
(011)(680) 488-2422
FAX(680)488-3312

Section 6. U.S. Coast Guard Districts

Commander, 1st Coast Guard District
Coast Guard Building
408 Atlantic Avenue
Boston MA 02210-3350
(617) 223-8480

Commander, 5th Coast Guard District
Federal Building
43 1 Crawford Avenue
Portsmouth VA 23704-5004
(804) 398-6000

Commander, 7th Coast Guard District
909 S.E. First Avenue
Brickell Plaza Federal Building
Miami FL 33 13 l-3050
(305) 536-5631

Commander, 8th Coast Guard District
Hale Boggs Federal Building
501 Magazine Street
New Orleans LA 70130-3396
(504) 589-6230

Commander, 9th Coast Guard District
1240 East 9th Street
Cleveland OH 44199-2060
(2 16) 522-3970

Commander, 1 1th Coast Guard District
Coast Guard Island
Alemeda, CA 94501-5 100
510-437-3324

Commander, 13th Coast Guard District
Jackson Federal Building
9 15 Second Avenue
Seattle WA 98 174- 1067
(206) 442-5078

Commander, 14th Coast Guard District
Prince Kalanianaole Federal Building
300 Ala Moana Boulevard, 9th Floor
Honolulu HI 96850-4982
(808) 541-2260

Commander, 17th Coast Guard District
P.O. Box 25517
Juneau AK 99802-55 17
(907) 586-7298

Section 7. Military Support

DOD Director of Military Support
c/o Army ODCSOPS (DAMO-ODS)
Pentagon, Room BF-762
Washington DC 203 1 O-0400
business hours: 703-697-3203
703-697-l 096
24 hour line: 703-697-02 18 (Army Operations Center)

The address and telephone number for the state AG's can be obtained from the office of the DOD Director of Military Support listed above.

This office can provide information on the availability of helicopters and all other forms of support from any of the active military services (Army, Navy, Air Force, and Marine Corps) located anywhere in the United States. This office also handles all requests for this type of support.

The State Adjutant General (AG) can provide information on the availability of helicopters and all other forms of support from any of the Air National Guard and Army National Guard units located in the State. The AG also handles all requests for this type of support. If additional assets are required, the AG serves as the channel for obtaining National Guard resources from other States and/or active military resources from the DOD Director of Military Support (DOMS).

Section 8. Professional and Industry Associations

Aircraft Owners and Pilots Association (AOPA)
421 Aviation Way
Frederick MD 2 170 1
301-695-2000

American Helicopter Society (AHS)
2 17 N. Washington Street
Alexandria VA 223 14
703-684-6777

American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohoken PA 19428-2959
610-832-9585
Web: HTTP://WWW.ASTM.ORG

Appalachian Helicopter Pilots Association
c/o Walker Machinery Co.
PO Box 2427
Charleston WV. 25329

Eastern Region Helicopter Council (ERHC)
Richard Dutson
c/o Bristol-Myers Squibb
Hanger D- 1
Westchester County Airport
White Plains NY 10604
914-761-5166
860-355-9722
OR
Pat Wagner
c/o Johnson Controls Inc. Heliport
421 East 60th Street
New York NY 10022
212-751-6133

Emergency Response Institute, Inc.
4537 Foxhall Drive, NE
Olympia WA 98516
360-49 l-7785
509-782-4832
Web: HTTP//WWW.ERI-INTL.COM

Hawaii Helicopter Operators Association
120 Kapalulu Place, Suite 120
Honolulu HI 968 19
808-836-8025

Helicopter Association Northwest
c/o Elliott Bay Aviation, Inc.
Seattle WA 98108

Helicopter Operators of Texas (HOT)
Mary Mitchell
PO Box 1016
Pearland TX 77588
713-482-6424

Helicopter Safety Advisory Conference
Richard Landfrurn
PO Box 60220
Houston TX 77205
713-443-2905

Michigan Helicopter Association
PO Box 2613
Suthfield MI 48037
5 17-223-7809

Mid-Atlantic Helicopter Association (MAHA)
c/o Dover International Limited
Reistertown MD 21136
410-561-3500

Midwest Helicopter Association
PO Box 427
Wonder Lake IL 60097
815-653-2900
Fax: 815-653-2277

National Association of State Aviation Officials (NASAO)
Metro Plaza One
8401 Colesville Road, Suite 505
Silver Spring MD 20910
301-588-1286

National EMS Pilots Association (NEMSPA)
110 North Royal Street, Suite 307
Alexandria VA 223 14
703-836-8732

New England Helicopter Pilots Association
PO Box 88
Bedford MA 01730
617-973-7181

Northwest Rotorcraft Association
111 SW Fifth Avenue, Suite 3500
Portland OR 97204
800-547-6922
503-286-0927

Professional Helicopter Pilots Association of California (PHPA)
PO Box 9558
Glendale CA 91206
2 13-254-9444
213-891-3636

South Carolina Helicopter Association
James Breznay
PO Box 24941
Columbia SC 29224
803-699-3 126

Western Helicopter Safety Advisory Council
PO Box 1337
Provo UT 84603
801-375-l 124

Section 9. Sources of Information

Sources of Information	Type of Information Available
Airborne Law Enforcement Association (ALEA) PO Box 3683 Tulsa, OK 74101-3683 918-599-0705	Public service helicopter operator members.
Association of Air Medical Services (AAMS) 110 North Royal St., Suite 307 Alexandria VA 223 14, 703-836-8732	Hospital and EMS helicopter operators.
Emergency Volunteer Air Corps c/o Rol Murrow 621 Stafford Road Sturrs, CT 06268-2738 860-423-900 1 72450.3066@CompuServe.COM OR c/o Ken Price PO Box 2677 Fallbrook, CA 92088 6 19-723-4593	An organization of general aviation and other personnel who can be of service during disasters and other public emergencies.
FAA Aircraft Registration Branch PO Box 25504 Oklahoma City, OK 73 125-0504 405-954-3 13 1	Aircraft owners by state, county, make and model. Aircraft may or may not be based in the same area as local owner/operator.
Helicopter Association International (HAI) 1635 Prince Street Alexandria, VA 223 14 703-683-4646 HTTP://WWW.ROTOR.COM	Member operators, aircraft types, missions by state. See list of regional rotorcraft associations to contact for more detailed information.

National Broadcast Pilots Association c/o Maurice Johnson Kendall Helicopters Intl. Inc. 14250 SW South 29th St. Miami FL 33186 305-27 l-8079 OR c/o Jack Ruland, WNEP TV 16 Montage Mountain Road Moosic PA 18507 7 17-346-7474	Helicopter operators in the broadcast media.
National Burn Victim Foundation (NBVF) PO Box 409 Basking Ridge NJ 07920 20 l-676-7700 HTTP://WWW.NBVF.ORG	Unique medical disaster response system designed to coordinate and facilitate the rapid transportation of skilled medical personnel, supplies, and equipment to thermal disaster sites.
National Business Aircraft Association (NBAA) 1200 18th Street, NW Washington DC 20036 202-783-9000	Member operators by state, aircraft types and mission.
State Aeronautics Divisions See individual state listings under Aeronautics Commissions or Authorities or Divisions under state Departments of Transportation in the telephone directory.	Aircraft owners by county. Types of aircraft available in states where there are aircraft registration requirements. List of aircraft operator organizations.
Yellow Pages under Aircraft Charter, Lease or Rental	Helicopter operators.

APPENDIX B.
OUTLINE OF ELEMENTS FOR
A TYPICAL HELICOPTER AND TILTROTOR INTEGRATION PLAN

The following is a title list for the major sections of a typical plan for integrating helicopters (and tiltrotors if appropriate) into emergency planning

I. Establish Goals

A. Guideline Goals

1. Save lives
2. Effective orientation with aircraft capabilities
3. Effective integration of helicopters and tiltrotors into local disaster preparedness
4. Open lines of communication between aircraft operators and the community
5. Encourage the establishment of heliports and vertiports

B. Assumptions

1. General plan for emergency preparedness in effect or development
2. Incident Command System usage
3. Vertical flight assets available
4. Ground-based ambulances are the primary, expected means of transport

C. Potential Helicopter and Tiltrotor Missions

1. Transport of medical teams/supplies to the disaster site
2. Transport of medical teams/supplies to the affected hospitals
3. Transport of trauma patients
4. Transport of disaster specialists
5. Emergency evacuation
6. Damage survey
7. Airborne control and assessment
8. Airborne air traffic control (AATC)
9. Electronic news gathering (ENG)
10. Fire fighting
11. External-load operations
12. Security and crowd control
13. Inspection tours
14. Hazardous material operations
15. Search and rescue
16. Return of personnel or equipment
17. Livestock support

II. Plan Prenaration

A. Fully understand existing plans, agreements, regulations, and jurisdictional issues
B. Train first responders in all elements of the plan
C. Activate air operations (AO) branch of the Incident Command System
D. Define alert levels
E. Identify manmade and natural hazards that could lead to a disaster
F. Develop special response procedures
G. Integration with the Federal Response Plan (FRP)

III. Aircraft Resource Inventory

A. Identify and survey helicopter and tiltrotor operators
B. Define operational requirements
C. Define capabilities and limitations of each participant
D. Periodically verify and update survey information

IV. Communications

A. Establish an emergency communications network

1. Command post
2. Incident Commander
3. Air operations (AO) center
4. Federal Aviation Administration air traffic control
5. Mission assignment and briefing
6. Medical information (patient status)
7. Local airborne air traffic control

B. Establish procedures and protocols

1. Federal airspace restrictions
2. Medical information
3. Air traffic control
4. Mission assignment
5. Documentation

V. Landing Areas

A. Selection criteria

1. Logistical support
2. Location
3. Size and slope
4. Surface composition
5. Obstructions and obstacle identification
6. Approach and departure paths
7. Wind indicator
8. Lighting
9. Security
10. Proximity to treatment areas

B. Site survey and inventory

1. Existing facilities
2. Potential temporary sites
3. Publish directory
4. Periodically review, re-validate, revise, and re-publish directory

VI. Plan Activation, Exercises, and Post-Incident Analysis

A. Activation checklist

B. Exercises

1. Plausible scenarios
2. Full-scale exercises
3. Modified-full-scale exercises
4. Table-top exercises

C. Post-incident analysis

1. Review logs books and other documentation
2. Debrief personnel
3. Identify deficiencies
4. Implement corrective action

APPENDIX C. BIBLIOGRAPHY

Federal Law

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Federal Regulations

Air Taxi Operators and Commercial Operators, Federal Aviation Regulation 14 CFR Part 135.

General Operating and Flight Rules, Federal Aviation Regulation 14 CFR Part 91.

Rotorcraft External-Load Operations, Federal Aviation Regulation 14 CFR Part 133.

National Oil and Hazardous Substance Pollution Contingency Plan (NCP), Environmental Protection Agency Regulation, 40 CFR 300.

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APPENDIX D. LIST OF ACRONYMS

AAID	Aircraft Assistance in Disaster
AAMS	Association of Air Medical Services
AATC	airborne air traffic control
AC	advisory circular
ADS	automatic dependent surveillance
ADS-B	automatic dependent surveillance - broadcast
AG	Adjutant General
AGL	above ground level
AHS	American Helicopter Society
AIP	airport improvement program
ALEA	Airborne Law Enforcement Association
AM	amplitude modulation
ANG	Air National Guard
AO	Air Operations
AOPA	Aircraft Owners and Pilots Association
ARNG	Army National Guard
ARTCC	Air Route Traffic Control Center
ASTM	American Society for Testing and Materials
ATC	air traffic control
AT&T	American Telephone & Telegraph
CAP	Civil Air Patrol
CB	citizens band
CFR	Code of Federal Regulations
CP	command post
CPG	Civil Preparedness Guide
EMS	emergency medical service
ENG	electronic news gathering
EOC	emergency operations center
EPA	Environmental Protection Agency
ERHC	Eastern Region Helicopter Council
ERT	Emergency Response Team
ETA	estimated time of arrival
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FATO	fmal approach and takeoff area
FCO	Federal Coordinating Officer
FDC	Federal Data Center
FEMA	Federal Emergency Management Agency
FLIP	flight information publications
FLIR	Forward Looking Infrared
FRP	Federal Response Plan
FM	frequency modulation

GPS	global positioning system
HAI	Helicopter Association International
HAZMAT	hazardous material
HELP	Helicopter Emergency Lifesaver Plan
HOGE	hover out of ground effect
HOT	Helicopter Operators of Texas
HRP	heliport reference point
hrs	hours
Ibid.	in the same reference
IC	Incident Commander
ICS	Incident Command System
IFR	instrument flight rules
IMC	instrument flight conditions
Lbs	pounds
LEPC	Local Emergency Planning Committee
LL	low lead (aviation fuel)
LZ	landing zone
MAHA	Mid-Atlantic Helicopter Association
MAP	missed approach point
MCI	mass casualty incident
medevac	medical evacuation
Mns	minutes
MRI	magnetic resonant imager
NASA0	National Association of State Aviation Officials
NBVF	National Burn Victim Foundation
NCP	National Contingency Plan
NEMSPA	National EMS Pilots Association
NFPA	National Fire Protection Association
NG	National Guard
NMI	nautical miles
NOAA	National Oceanic and Atmospheric Administration
NOTAM	notice to airmen
NPIAS	National Plan of Integrated Airport Systems
OL	overall length (of the largest helicopter)
Ops	operations
PAX	passengers
PHPA	Professional Helicopter Pilots Association of California
P.L.	Public Law
RD	rotor diameter
RNAV	area navigation
EPC	Regional Planning Committee
SAR	search and rescue
SARDA	State and Regional Disaster Airlift
TFR	temporary flight restriction
TLOF	touchdown and liftoff area

UHF	ultra high frequency
USCG	United States Coast Guard
VHF	very high frequency
VMC	visual meteorological conditions
Xpond	transponder

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